JOURNAL
OF THE
FRANKLIN INSTITUTE
OF THE
State of Pennsylvania,
DEVOTED TO THE
MECHANIC ARTS, MANUFACTURES, GENERAL SCIENCE
AND THE RECORDING OF
AMERICAN AND OTHER PATENTED INVENTIONS.

SEPTEMBER, 1831.

FOR THE JOURNAL OF THE FRANKLIN INSTITUTE.

On the height of Water in Boilers of Locomotive Engines.

By Franklin Peale.

The gauge cocks of boilers, are certainly one of the most important parts of a steam engine; upon their indications we rely for the knowledge of the proper height of water in the boiler, and, of consequence, for the full and efficient operation of the engine; and what is of no less importance, the safety of all who may be within reach of its influence. Any facts, therefore, relative to this portion of an engine, must be acceptable to the public.

High pressure, alone, being applicable to locomotive purposes on land, our observations must be considered as applying particularly, though not exclusively, to this variety of steam power.

When a boiler, in which the steam is raised, is at perfect rest, that is to say, when the engine which it is intended to supply is not in motion, or otherwise disturbed, the surface of the water, or as it is called, the "water line," is accurately defined, and if, for the sake of illustration, we suppose that gauge cocks were placed at fractions of an inch in relative height, the position of the surface of the water would be indicated with great accuracy at the moment when the cock at the same elevation was opened, but if it is kept open, a current is established in the direction of the escape, and it is no longer a perfect indication. So true is this, that if you open a cock some distance above the surface of the water, steam only, at first, passes out, but ultimately steam and water, and the duration of the interval between the opening and the appearance of water, will depend on the relative height of the gauge cock, the surface of the water, and the degree of pressure upon the boiler at the time at which the experiment is made.

One of our papers, a few months back, contained a statement of a fact intimately connected with this subject, observed upon the trial of a model engine, and also asked for a solution of the phenomenon, which may, I think, readily be given.

The statement, if we remember rightly, says, that steam was raised in a small high pressure boiler, the safety valve of which was then lifted by hand; the steam was immediately followed by water, and ultimately the whole of the water in the boiler was expelled through the valve.

I have frequently lifted the safety valve of a small boiler, with invariably the same result; water always made its appearance after a brief interval. The solution is easy—a certain quantity of heat is contained in the water of the boiler, which, when the pressure is taken off, by the raising of the valve, is sufficient to cause the water to rise in foam, and is nothing more or less than is expressed in the language of the kitchen, by the phrase, "the kettle is boiling over."

When an engine is set in motion, and the steam thereby taken off, the ebullition necessary for a further supply, disturbs the surface of the water, and the gauge cock is no longer so decided in its indications, but requires a considerable degree of practical experience to be able to decide, from the appearance of the escaping steam and water, the precise height of the water line, but to a sufficiently practiced eye there is no difficulty. It is not so when a locomotive engine is running on a rail-way. The agitation of the engine is considerable, and a correspondent effect is produced on the water in the boiler, and it then becomes extremely difficult, if not impossible, to tell its height. This is a fact of immense importance in the management of an engine, and yet it is one that was not anticipated by men of science, and of which even practical engineers were uninformed. In company with several engineers, and other gentlemen of science, at a recent trial of a locomotive engine, I was witness to a case exactly in point; it was in action without locomotion; the wheels being raised so as to prevent adhesion; the gauge cocks all indicated water; the engine was then stopped, when, to the surprise of those present, no water was found at the lowest cock, and no human being could ascertain what was the height of water in the boiler at that time, a circumstance that should never occur, for reasons that every one who has any knowledge of the subject must know and admit.

It is much easier to state the difficulty than to devise a remedy. We have received as yet little or no assistance from our more experienced predecessors, the English. The general form and arrangement of their engines, and the results of trials with them, is nearly all we know; what we require is minute descriptions of the important parts of the engine, and full and close details of their management. Information of this character will be of the utmost utility.

At present we must rely on the care of engineers in this matter; the supply pump must be efficient in its operation; the quantity of water supplied in a given distance must be known and governed by the combined and relative velocity and load; and, above all, there must be frequent stoppages at short distances for the purpose of examination.

Careful experiment and sufficient experience may give confidence, but it is extremely desirable that the state of water in boilers should be made more evident to observation than appears to be possible with the present arrangement.

TABLE D.—PART I.

CHUTE No. 1.—*Gate c. Over-shot. Centre buckets. Close breast. Water let on at upper centre of wheel.*

No. of Exper't.	Head of water above. Bttm. of gate.	Head of water above. Top of bkt.	Head of water above. Bttm. of bkt.	Width of Aperture.	Weight raised.	Friction.	Sum of friction and weight raised.	Height raised.	Time.	Velocity per second.	W'tofwater expended.	Head and fall.	Power.	Effect.	Ratio, power being 1.	Maximum effect.	Velocity at maximum.	Observations.
	Feet.	Feet.	Feet.	In.	Pds.	Pounds.	Pounds.	Feet.	Seds.	Feet.	Pds.	Feet.						
1	2.75	3.00	3.60	1.00	875	55.34	930.34	41.5	41	9.53	2835	23.00	652050	386091	.592	- -	- -	Much water thrown over side of wheel.
2					978	57.14	1035.14		45	8.69	3025		695750	429583	.617			
3					1081	58.94	1139.94		50	7.82	3280		754400	473075	.627			Air vents closed.
4					1184	60.74	1244.74		52	7.52	3560		818800	516567	.630			
5					1287	65.11	1352.11		57	6.85	3850		885500	561126	.634	.634	6.86	
6					1390	69.48	1459.48		61	6.40	4180		961400	605684	.630			
7					1493	73.85	1566.85		65	6.01	4500		1035000	650243	.628			
8					1596	78.22	1674.22		71	5.50	4850		1115500	694801	.623			
9					1699	82.59	1781.59		79	4.95	5280		1214400	739360	.609			
10	2.75	3.00	3.60	1.25	1596	78.22	1674.22	41.5	59	6.62	4850	23.00	1115500	694801	.623	.623	6.62	Much water wasted.
11					1699	82.59	1781.59		63	6.20	5175		1190250	739360	.611			
12					1802	86.96	1888.96		67	5.83	5550		1276500	783918	.614			
13	1.25	1.50	2.10	1.25	1184	60.74	1244.74	41.5	69	5.66	3750	21.50	806250	516567	.640	6.40	5.66	
14					1287	65.11	1352.11		76	5.14	4125		886875	561126	.632			
15					1390	69.48	1459.48		79	4.95	4440		954600	605684	.634			
16	0.75	1.00	1.60	1.50	978	57.14	1035.14	41.5	58	6.73	3125	21.00	656250	429583	.654			
17					1081	58.94	1139.94		63	6.20	3400		714000	473075	.662			
18					1184	60.74	1244.74		69	5.66	3690		774900	516567	.666	.666	5.66	
19					1287	65.11	1352.11		76	5.14	4075		855750	561126	.656			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

(Continued from p. 40.)

Table D.—Part II.

Chute No. 1.—*Gate c. Over-shot. Centre buckets. Close breast. Water let on at upper centre of wheel.*

No. of Exper't.	Head of water above. Bttm. of gate.	Head of water above. Top of bkt.	Head of water above. Bttm. of bkt.	Width of Aperture.	Weight raised.	Friction.	Sum of friction and weight raised.	Height raised.	Time.	Velocity per second.	Wt of water expended.	Head and fall.	Power.	Effect.	Ratio. power being 1.	Maximum effect.	Velocity at maximum.	Observations.
	Feet.	Feet.	Feet.	In.	Pds.	Pounds.	Pounds.	Feet.	Scds.	Feet.	Pds.	Feet.						
20	0.50	0.75	1.35	1.50	875	55.34	930.34	41.5	68	5.75	2925	20.75	606937	386091	.636			
21					978	57.14	1035.14		75	5.21	3200		664000	429583	.646			
22					1081	58.94	1139.94		84	4.65	3500		726250	473075	.651	.651	4.65	
23	0.50	0.75	1.35	2.00	875	55.34	930.34	41.5	60	6.51	2900	20.75	601750	386091	.641			
24					978	57.14	1035.14		67	5.83	3150		653625	429583	.657			
25					1081	58.94	1139.94		75	5.21	3450		715875	473075	.660	.660	5.21	
26					1184	60.74	1244.74		84	4.65	3775		783312	516567	.659			
27	2.75	3.00	3.60		772	53.54	825.54	4.51	40	9.17	2650	23.00	609500	342599	.562			} Air vents open.
28					875	55.34	930.34		42	9.30	2885		663550	386091	.582	.582	9.30	
29					978	57.14	1035.14		48	8.14	3225		741750	429583	.579			
30					1081	58.94	1129.94		53	7.37	3560		818900	473075	.577			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

TABLE E.—PART I.

CHUTE NO. 2.—*Elbow buckets. Close breast. Bottom of gate seventeen feet above bottom of wheel.*

No. of Exper't.	Head of water above. Btm. of gate.	Top of bkt.	Btm. of bkt.	Width of Aperture.	Weight raised.	Friction.	Sum of friction and weight raised.	Height raised.	Time.	Velocity per second.	Wt of water expended.	Head and fall.	Power.	Effect.	Ratio, power being 1.	Maximum effect.	Velocity at maximum.	Observations.
	Feet.	Feet.	Feet.	In.	Pds.	Pounds.	Pounds.	Feet.	Scds.	Feet.	Pds.	Feet.						
1	6.00	7.66	8.82	0.25	463	47.99	510.99	41.5	56	6.98	1750	23.00	402500	212061	.527			
2					566	49.76	615.76		50	7.82	2025		465750	255540	.548			
3					669	51.57	720.57		56	6.98	2350		540500	299020	.553			
4					875	55.03	930.03		62	6.30	3000		690000	385979	.559	.559	6.30	
5					1184	60.38	1244.38		90	4.35	4100		943000	516418	.547			
6					1287	64.74	1351.74		107	3.65	4575		1052250	516567	.533			
7	6.00	7.66	8.82	0.50	1287	64.74	1351.74	41.5	60	6.51	4050	23.00	931500	560972	.602			
8					1390	69.11	1459.11		53	7.37	4275		983250	605531	.616			
9					1493	73.48	1566.48		56	6.98	4600		1058000	650089	.614			
10					1596	77.85	1673.85		58	6.73	4900		1127000	694643	.617	.617	6.98	
11					1699	82.22	1781.22		63	6.20	5250		1207500	739206	.612			
12					1802	86.59	1888.59		68	5.75	5600		1288000	783765	.608			
13					1905	90.96	1995.96		72	5.43	5975		1374250	828323	.602			
14					2008	95.33	2103.33		87	4.49	6525		1500750	872882	.581			
15					2111	99.70	2210.70		95	4.11	6875		1581250	917440	.580			
16					2214	104.07	2318.07		104	3.76	7340		1688200	961999	.569			
17					2317	108.44	2425.44		112	3.49	7825		1799750	1006557	.559			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

Table E.—Part II.

Chute No. 2.—*Elbow buckets. Close breast. Bottom of gate seventeen feet above bottom of wheel.*

No. of Exper't.	Head of water above. Bttm. of gate.	Head of water above. Top of bkt.	Head of water above. Bttm. of bkt.	Width of Aperture.	Weight raised.	Friction.	Sum of friction and weight raised.	Height raised.	Time.	Velocity per second.	Wt of water expended.	Head and fall.	Power.	Effect.	Ratio, power being 1.	Maximum effect	Velocity at maximum.	Observations.
	Feet.	Feet.	Feet.	In.	Pds.	Pounds.	Pounds.	Feet.	Scds.	Feet.	Pds.	Feet.						
18	3.75	5.41	6.57	0.25	463	47.99	510.99	41.5	47	8.31	1775	20.75	368312	212061	.576			
19					669	51.53	720.53		58	6.74	2400		498000	299020	.600	.600	6.74	
20					875	55.07	930.07		80	4.87	3125		648417	385979	.595			
21					978	56.84	1034.84		88	4.44	3475		721062	429458	.595			
22					1081	58.61	1139.61		98	3.99	3850		798875	472938	.589			
23					1184	60.38	1244.38		112	3.49	4275		887062	516418	.582			
24					1287	64.74	1351.74		127	3.08	4685		972137	560972	.577			
25	3.75	5.41	6.57	0.50	1287	64.74	1351.74	41.5	67	5.83	4225	20.75	876687	560972	.639	.639	5.84	
26					1390	69.11	1459.11		78	5.01	4650		969875	605531	.624			
27					1493	73.48	1566.48		90	4.35	5100		1058250	650089	.614			
28					1699	82.22	1781.22		90	4.35	5875		1219062	739206	.604			
29					1905	90.96	1995.96		102	3.83	6675		1385063	828333	.598			
30					2008	95.33	2103.33		116	3.37	7185		1490887	872882	.585			
31	0.75	2.41	3.57	0.50	463	47.90	510.99	41.5	43	9.09	1725	17.75	306187	212061	.692			
32					669	51.53	720.53		57	6.86	2350		417125	299020	.717			
33					875	55.07	930.07		75	5.21	2975		528062	385979	.731	.731	4.88	
34					978	56.84	1034.84		89	4.40	3325		590187	429458	.727			
35					1081	58.61	1139.61		95	4.11	3685		654087	472938	.723			
36					1184	60.38	1244.38		109	3.95	4050		718875	516418	.718			
37					1287	64.74	1351.74		121	3.22	4425		785437	560972	.714			
38					1390	69.11	1459.11		122	3.20	4810		853775	605531	.709			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

Table E.—Part III.

Chute No. 2.—*Elbow buckets. Close breast. Bottom of gate seventeen feet above bottom of wheel.*

No. of Exper't.	Head of Water above.			Width of Aperture.	Weight raised.	Friction.	Sum of friction and weight raised.	Height raised.	Time.	Velocity per second.	Wt of water expended.	Head and fall.	Power.	Effect.	Ratio, power being 1.	Maximum effect.	Velocity at maximum.	Observations.
	Bttm. of gate.	Top of bkt.	Bttm. of bkt.															
	Feet.	Feet.	Feet.	In.	Pds.	Pounds	Pounds.	Feet.	Scds.	Feet.	Pds.	Feet.						
39	0.75	2.41	3.57	0.75	1390	69.11	1459.11	41.5	90	4.35	4790	17.75	850225	605531	.712	.712	4.35	
40					1493	73.48	1566.48		103	3.79	5200		923000	650089	.704			
41					1596	77.85	1673.85		111	3.52	5575		989562	694643	.701			
42					1699	82.22	1781.22		118	3.31	5960		1057900	739206	.698			
43					1802	86.56	1888.56		126	3.10	6310		1120025	783752	.699			
44	0.75	2.41	3.57	1.00	1802	86.59	1888.59	41.5	99	3.95	6400	17.75	113600	783765	.690			
45					1905	90.96	1995.96		108	3.62	6575		1167062	828323	.709	.709	3.62	
46					2008	95.33	2103.33		111	3.52	7075		1255812	872882	.695			
47					2111	99.70	2210.70		117	3.34	7475		1326762	927440	.691			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

Table F.—Part I.

Chute No. 2.—*Centre buckets. Close breast. Bottom of gate seventeen feet above bottom of Wheel.*

No. of Exper't	Head of Water above.			Width of Aperture.	Weight raised.	Friction.	Sum of friction and weight raised.	Height raised.	Time.	Velocity per second.	Wt of water expended.	Head and fall.	Power.	Effect.	Ratio, power being 1.	Maximum effect.	Velocity at maximum.	Observations.
	Btm. of gate.	Top of Bkt.	Btm. of Bkt.															
	Feet.	Feet.	Feet.	In.	Pds.	Pounds	Pounds.	Feet.	Scds.	Feet.	Pds.	Feet.						
1	6.00	7.66	8.82	0.50	669	51.53	720.53	41.5	37	10.56	2775	23.00	638250	299020	.468			
2					772	53.30	825.30		39	10.02	3110		715300	342499	.478			
3					875	55.07	930.07		43	9.09	3435		790050	385979	.488			
4					978	56.84	1034.84		49	7.98	3725		856750	429458	.501			
5					1081	58.61	1139.61		56	6.98	4030		926900	472938	.510			
6					1184	60.38	1244.38		60	6.50	4350		1000500	516418	.516			
7					1287	64.74	1351.74		59	6.62	4570		1051100	560972	.533			
8					1390	69.11	1459.11		57	6.86	4800		1104000	605531	.548	.548	6.86	
9					1493	73.48	1566.48		68	5.75	5175		1190250	650089	.546			
10					1596	77.85	1673.85		76	5.14	5825		1339750	694643	.518			
11					1699	82.22	1781.22		81	4.83	6230		1432900	739206	.515			
12	3.75	5.41	6.57	0.50	978	56.84	1034.84	41.5	51	7.66	3800	20.75	788500	429458	.544			
13					1081	58.61	1139.61		57	6.86	4150		861125	472938	.549			
14					1184	60.38	1244.38		71	5.50	4525		938937	516418	.550			
15					1287	64.74	1351.74		66	5.92	4820		1000150	560972	.560	.560	5.92	
16					1493	73.48	1566.48		82	4.77	5675		1177562	650089	.552			
17	3.75	5.41	6.57	0.75	1081	58.61	1139·61	41.5	46	8.50	4025	20.75	835187	472938	.566			
18					1390	69.11	1459·11		60	6.50	5025		1042687	605531	.580	.580	6.50	
19					1493	73.48	1566.48		65	6.01	5475		1136062	650089	.572			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

TABLE F.—PART II.

CHUTE No. 2.—*Centre buckets. Close breast. Bottom of gate seventeen feet above bottom of wheel.*

No. of Exper't.	Head of water above. Bttm. of gate.	Top of bkt.	Bttm. of bkt.	Width of Aperture.	Weight raised.	Friction.	Sum of friction and weight raised.	Height raised.	Time.	Velocity per second.	Wt of water expended.	Head and fall.	Power.	Effect.	Ratio, power being 1.	Maximum effect.	Velocity at maximum.	Observations.
	Feet.	Feet.	Feet.	In.	Pds.	Pounds.	Pounds.	Feet.	Scds.	Feet.	Pds.	Feet.						
20	0.75	2.41	3.57	0.50	772	53.30	825.30	41.5	86	4.54	3525	17.75	625687	342499	.544			
21					875	55.07	930.07		86	4.54	3850		683375	385979	.564			
22					978	56.84	1034.84		88	4.44	4200		754500	429458	.576	.576	4.44	
23					1081	58.61	1139.61		111	3.52	4775		847562	472938	.555			
24	0.75	2.41	3.57	0.75	978	56.84	1034.84	41.5	71	5.50	4200	17.75	745500	429458	.576			
25					1081	58.61	1139.61		73	5.35	4425		785437	472938	.602	.602	5.35	
26					1184	60.38	1244.38		88	4.44	5025		891937	516418	.578			
27	0.75	2.41	3.57	1.00	978	56.84	1034.84	41.5	58	6.74	4025	17.75	714437	429458	.601	.609	5.75	
28					1081	58.61	1139.61		64	6.10	4420		784550	470938	.602			
29					1184	60.38	1244.38		68	5.75	4775		847562	516418	.609			
30					1287	64.74	1351.74		83	4.71	5325		945187	560972	.593			
31	0.75	2.41	3.57	1.25	978	56.84	1034.84	41.5	50	7.82	4075	17.75	723312	429458	.595			
32					1081	58.61	1139.61		58	6.74	4350		772125	472938	.611			
33					1184	60.38	1244.38		62	6.30	4750		843125	516418	.612			
34					1390	69.11	1459.11		67	5.84	5400		958500	605531	.631	.631	5.84	
35					1493	73.48	1566.48		77	5.07	6000		1065000	650089	.610			
36	0.75	2.41	3.57	1.50	1390	69.11	1459.11	41.5	45	8.70	5300	17.75	940750	605531	.643			
37					1493	73.48	1566.48		48	8.14	5700		1011750	650089	.642			
38					1596	77.85	1673.85		51	7.66	6050		1073875	694643	.646			
39					1699	82.22	1781.22		55	7.10	6450		1144875	739198	.645			
40					1802	86.59	1888.59		57	6.86	6760		1199900	783675	.653	.653	6.86	
41					1905	90.96	1295.96		63	6.20	7225		1282437	823323	.645			
1	2.	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

[TO BE CONTINUED.]

An examination of the allegations made under the signature of "JUSTICE," *respecting the patents for a Percussion Cannon Lock, obtained by Joshua Shaw, and by Lieutenant Bell.—By* JOSHUA SHAW.

TO THE EDITOR OF THE JOURNAL OF THE FRANKLIN INSTITUTE.

SIR,—In the Journal of the Franklin Institute, May, 1831, I find a reply to my observations touching the conduct of Lieut. W. H. Bell, in relation to a patent taken out by that gentleman for a percussion cannon lock, &c. signed "JUSTICE," which I think I shall be able to prove, in the course of the following remarks, to have been a most unappropriate title. In commenting upon this gratuitous article, I will not, in imitation of this *friend in need*, attempt to divert attention from the main question, by statements not the less mischievous, because told with apparent simplicity and truth; and which, until refuted, might be supposed to furnish a direct disproval of my general charges against Lieut. Bell. If, in making them, I have not been sufficiently explicit, I will now repeat them in more definite terms. I said that Lieut. Bell had infringed my patent right, and I now further say, that he has compromised the good faith, and violated the pledge of the government of the United States towards me, notwithstanding he "*belongs to a profession which tolerates no dishonourable conduct in any of its members.*"

It is easy to make charges and quite as easy to deny them, and little room may be required for either, except where the statements controverted require to be supported by reference to veritable documents, which, under present circumstances, it is indispensable upon me to do; but I will be as brief as possible, touching only upon those statements which may seem, until analysed, to refute my imputations against Lieut. Bell.

In the first place, JUSTICE states that Lieut. Bell, is "*now absent at a remote station, where he may not, for a long time, meet with these foul aspersions on his character.*" It is believed that the Lieutenant, at the time the No. containing my charges against him appeared, was in Norfolk, Virginia; was, about the time his defence was undertaken, in Washington, on his way to Philadelphia; and was shortly afterwards, and is now, stationed at the Delaware Breakwater.—Secondly, JUSTICE says, "that Lieut. Bell applied to me," *as a manufacturer of percussion primers, to procure a number of these articles, made according to a particular pattern, but which he did not obtain.* But why he did not, is not mentioned; at the proper time I may explain the secret, although I do not conceive it important to the point in question. In continuance he says, "*this occasion was certainly the first*, and it is believed the ONLY ONE, *on which Lieut. Bell ever saw Mr. Shaw.*" This I assent to, and beg particular attention to the words JUSTICE has marked in italics, as claiming especial notice; this meeting, we are told, occurred on the 18th day of April, 1829—this is indeed valuable information to me, as it fixes the time, and furnishes data very important should this dispute be

ever argued in a court of law, should such evidence be there deemed admissible; it is indeed a two edged sword put into my hands, as I shall hereafter show the inconsistency of this visit of Lieut. Bell.

It is further said by JUSTICE, that "*the instrument for which Lieut. Bell has obtained a patent, was made and applied in the manner directed in his specification on, or before, the 13th of October*, 1828, *more than seven months prior to the interview with Mr. Shaw.*" That "*the merits of the instrument were successfully demonstrated on that day, and the trial of it was continued on subsequent days, for several weeks, and until it had fired a cannon one thousand times*," &c.

It does not perhaps occur to the reader how convenient in this stage of the dispute it was for the gentleman to call the lock and its appendages an instrument, in place of an invention;—an instrument cannot be patented without it be capable of some new employment or useful purpose,—the principle was known and discovered by myself, the instrument was only employed to produce the effect, and this was the view taken by the Board of Ordnance, as will appear from a letter to me, from Col. J. Bomford, President of the Board, bearing date October 8th, 1824, and which I shall give verbatim before I close this article. I repeat that it was a happy expedient to call it an instrument, and keep out of sight any other term, as if the merits rested alone upon the lock, rather than the combinations and materials acting in concert with it. I have innumerable evidences in my possession signed Col. Geo. Bomford, authorized by the Secretary at War, which go to prove that the mode of acting upon the primer was not viewed as material, the object was to effect it by the simplest possible means; by a hammer, for example, if found convenient, and which might be retained in the hand. And the letters referred to go to prove that the authorities at Washington viewed the whole affair in this light; they solicit my confidence, and assure me that they admit the value of my discovery, and that in obtaining possession of all the necessary information, and *instruments*, which I placed at their disposal, their only object was to determine for themselves, by actual experiment, the best mode of applying the principle, and then to afford *me* the advantages of these results, as the effect of my invention.

JUSTICE has said that Lieut. Bell had determined in practice the merits of his instrument, more than seven months prior to his call upon me for primers, and that he actually fired it a thousand times, and, of course, had used 1000 primers; how happened it, if Lieut. Bell could furnish himself with 1000 primers, that he should call on me for so small a quantity as three or four hundred, for it must be observed, that the primer and its application, is, as it were, the essence, and constitutes one of the principal merits of the invention. Now, if he could supply himself with the larger, surely he could have supplied the smaller quantity. It is also stated, that there is one material difference between the two instruments, meaning mine and Lieut. Bell's, which is, that when applied to "*the purposes for which both are alike designed*, the one never fails, the other never succeeds." Really any person who had a spark of modesty, or re-

gard for truth, must, upon reading this assertion, blush for the profession which tolerates nothing dishonourable in any of its members; an assertion which is, as I think I shall prove, irrefutably contradicted by the minutes taken by officers appointed to preside during experiments made at different times, by order of the Board of Ordnance, at various and very distant dates, duplicates of which I now hold in the hand writing of the officers so appointed. Other numerous experiments were made in the presence, and under the direction of the highest officers in the Navy Department, to whom the declaration made by JUSTICE would imply an insult, inasmuch as it would pursuade us, that the Navy Commissioners had been throwing away the public treasure upon a worthless and totally useless affair, without common prudence or reflection, or the least regard for the public service over which they have control. The next statement which I shall notice is yet more absurd; if correct, it would implicate gentlemen of the first respectability in Washington, as being guilty of the basest duplicity, and would lead to the supposition, that they had been leagued with me, to impose upon the government by false representations, &c., for if it be on official record, that this invention of mine was communicated to me more that eight years ago, what ignorant and misjudging individuals must preside over the public interests at Washington, who, being in possession of these facts, would yet cause such numerous and expensive experiments to be carried on from time to time, and during more than two administrations since 1823. I really feel ashamed to argue such points, as they are altogether of such a character as to merit little notice from any but those who will not think for themselves, and such as believe in any thing they are told. If it be true that the inventions claimed by me were suggested by others, what shall be said of those claims set up by Lieut. Bell, who was, confessedly, put into possession of materials for the purpose of experimenting upon them, for objects which were agreed upon and understood between the Board of Ordnance and myself, and defined by words as clear and unequivocal as common sense could well suggest, as I shall soon show: Lieut. Bell was at this time an officer in the service, receiving his pay as such whilst engaged in these experiments upon my invention,—now it is a point long since decided by the courts, that if any person in the employment of another, make any discovery predicated upon such employment, and growing out of it, while so employed, it belongs to the principal, (the employer,) and was so acted upon in a case in which Fairman & Perkins were concerned against one of their workmen. Now admitting, for the sake of the argument, that the record does exist, it must apply alike to both of us, or it was no record at all. There is, however, this difference between us, I had been labouring hard for years, without remuneration, expending several thousand dollars, while he, in the pursuance of his experimental duty, was paid from day to day for his labour: perhaps JUSTICE in his zeal did not perceive that in this attempt to assault me, he dealt a blow at his friend likewise.

I deny that information was ever conveyed to me from any quar-

ter that furnished *any*, even the most distant, hints of my invention. I must have been singularly unwise indeed, to have laboured so intently, and so long, to arrive at that conclusion, which was an *official record*.

I now submit, in support of my statements, written facts, in evidence, and which are at the command of any who may be disposed to call and examine for themselves. The first I shall refer to is the minutes of experiments made at Frankford, by order of the Board of Ordnance, Nov. 20, 1823. The result was successful and approved by the Board, and the idea acknowledged to be originally suggested by me, in a communication I received signed by Col. Geo. Bomford, on ordnance duty, in which he says, that the Secretary of War had referred my application to him, to the Ordnance Department, &c. Then comes minutes of experiments made on the 19th day of May, 1825, by order of the Board; presiding officer Lieut. Baird; also at Frankford, on an 18 pound gun, the powder cased in three thicknesses of flannel, with a view to test this discovery, and prove its efficiency to perform a duty two-thirds greater than was required in actual service, and the result was, that with every disadvantage incidental to new discoveries, the gun was fired fourteen times in regular succession; it was then proposed to soak the primers 15 minutes in water, it failed twice to take effect in consequence of the water saturating the primer; a dry primer was then tried, which succeeded. I have, however, since rendered these primers proof to a soaking of 15 minutes in water, and tested them in the presence of Commodore Bainbridge at the Navy Yard, in Philadelphia, on a 24 lb. gun, intended for the Vandalia, who, shortly afterwards, had all her guns mounted with my locks, which, during a cruise of more than two years, on the South American station, have given entire satisfaction; which information I have received from different officers resident in Philadelphia. The fitting out of the Vandalia with my locks was experimental, and it is not to be supposed, that new instructions would have been given me from time to time to manufacture others, if the first had not given ample satisfaction. A few words more and I have done; it must not be forgotten that Lieut. Bell was specially employed by the Board of Ordnance, to carry on a series of experiments upon the principle of my discovery, the object of which was, to come at the most convenient mode of adapting it in the service of the United States, as my vouchers will show; but this gentleman was not satisfied with the honour thus conferred upon him, and believed, as I suppose he did, that any change in the arrangement of the means employed, would confirm the right in him, and thus enable him to reap the harvest due to me.

I shall now offer copies of two letters, which will speak for themselves, and will then close this uninteresting dispute with a very few further remarks.

ORDNANCE DEPARTMENT, *Washington, October* 3, 1824.

Mr. JOSHUA SHAW, *Philadelphia,*

SIR,—Your letter of the 11th ult. was duly received. Col. Bom-

ford is at present absent from the city, but before his departure he instructed me to inform you that he was desirous of giving a further and more extensive trial to your percussion primers for cannon, and for this purpose wishes to obtain a considerable number of them, say 1000 at least. From trials already made, strong hopes are entertained that the results will be satisfactory. As a preliminary, however, to the adoption of this method of firing cannon, the department must possess the means of making the primers at the arsenals. It is therefore proposed to you to furnish a machine, with all the necessary directions for making the primers, together with a small supply of the primers made by yourself, and a suitable lock for firing them, for all which the department will pay whatever may be a reasonable compensation for your time, services, and expenses, provided the whole amount shall not exceed three hundred dollars.

If you accede to this proposition, *the machine, and other means which you may furnish*, will be received by the department *under a pledge* that they shall be used *for no other purpose than that of making experiments to test their value and usefulness in service.* If, after a sufficient trial, it shall be determined to adopt the primers, the department will then enter into such further agreement with you, as may be satisfactory to both parties. You will perceive that the above proposition calls for nothing more than possession of the *requisite means* for ascertaining the real merits of the invention, with a view to its adoption or rejection, as the case may be.

Respectfully, I am, Sir,
Your ob'nt serv't,

W. WADE,
Captain on Ordnance Duty.

Now, if this was the only letter explaining the nature of the assurances made to me, some doubts might perhaps exist as to the full extent and meaning of the letter here given; but as I have numerous others, all tending to show, that it was not the *instrument*, but the *invention*, taken as a whole, that was valuable, and which my patent either does or was intended to cover, and also showing that the sole object of the Board was to vary the experiments, with such means, and aided by such information, as I could suggest, until they should be able to *adopt or reject it.* I solemnly declare that I did, at least nine or twelve months, before Lieut. Bell called upon me, inform Col. Bomford, verbally, of what I had invented in respect to *clearing the ventfield of all obstruction.* Indeed I had calculated upon this improvement from the first moment, and if any one will examine my specification, they will find positive evidence of it; I quote the passage I allude to; it is in the third division of the specification; having described the lock, as adopted by the Navy Commissioners, I go on to state, that amongst other advantages and modifications, that it can be so changed or modified, *as to leave the sighting and the ventfield clear.* This patent was secured on the 24th day of October, 1828, and will tend to prove that the very materials and information which I had furnished, and which were to be experimented on, as it

were in trust for me, under pledges, the nature and bearings of which cannot be misunderstood, was insidiously taken away from me, and is placed to the account of Lieut. W. H. Bell. Now, it must appear that this friend was really unacquainted with all the particulars which he pretended to understand, or was determined to conceal material facts. In *any* case, his statements are an aggravation of the wrong already inflicted upon me; and if the latter motive prevailed, he has identified himself with the guilty party.

The following is a copy of a short letter received from Commodore Bainbridge:

Mr. Shaw having invented a Percussion Cannon Lock, and exhibited the same for experiment at this yard, which experiment was satisfactorily made in the presence of myself and several officers of the navy; and the lock, by recommendation, adopted in our naval service, as being very superior to any cannon lock heretofore used: since then, Mr. Shaw has made an improvement on his first lock, and it is now probably as perfect as a thing of that kind can be made.

(Signed,) WM. BAINBRIDGE.

Dated at the Navy Yard, Philadelphia, 15th April, 1829.

On the 7th January, 1831, a Military Committee, appointed by Congress, made a report respecting an application of mine, the purport of which is not material here; but there is a passage in it, which I shall quote, that has an immediate bearing upon the present question. It runs thus:

"It appeared to the Committee, by the concurrent testimony of officers of the highest respectability in the navy and the army of the United States, that the memorialist had not overrated his merits, and that he was justly entitled to the reputation of great ingenuity, judiciously applied to an important military object," &c.

I now submit it to a candid public, whether I have, or have not, sustained my charges against Lieut. Bell? and also, whether JUSTICE, who says it is the duty of a friend, "*to whom all the material facts of the case are known, to lay a brief statement of them before the readers of the Journal*," has, or has not told the truth, the whole truth, and nothing but the truth.

Should JUSTICE think proper to make any rejoinder, it will be necessary for him to do so under the sanction of his proper name; as I shall not, hereafter, reply to any charges, or attack any defences, set up by an anonymous writer.

I remain, Sir, yours,

JOSHUA SHAW.

Philadelphia, July, 1831.

Remarks by the Editor.—This Journal is intended for the promotion of general information; in endeavouring to attain this end, individuals will sometimes feel themselves aggrieved, and will have some just claim to be heard through the medium of our pages. So long as a discussion is calculated to unfold the truths of science, it may be

legitimately continued, if not too much wiredrawn; when, however, the dispute becomes merely personal, and is incapable of adjustment excepting by a court and jury, the public will cease to partake of that interest with which the combatants may be animated, and it is then time to seek a new arena. Such, we think, is the state of the present contest. Common courtesy, however, demands that Lieut. Bell, or his friend, JUSTICE, should be heard in reply to the preceding. But, let it be remembered, that "brevity is the soul of wit."

TO THE EDITOR OF THE JOURNAL OF THE FRANKLIN INSTITUTE.

On Oiling Rail-way Carriages.

SIR,—There is no difficulty in oiling axles continually, but to do it so as not to waste a drop of oil, has not been done, I believe, till the latest improvements in the friction saving carriage of the Baltimore rail-road, where very accurate experiments have been making by Mr. Geo. Brown, one of the principal proprietors in that work; the result of which, he informs me, is, that one quart of oil will be sufficient for 2000 miles run of a carriage, which, with its load, weighs three tons. He informs me at the same time, that he has ascertained, that the Lehigh rail-way carriages consume four quarts in running 821 miles with one ton. This you will perceive is nearly *thirty times as much.*

The manner of oiling the Winan's wagon is peculiar to its construction as now improved. The secondary wheels now run in a cast iron case, the top of which is formed so as to affix to the under surface of the side timbers of the frame of the wagon. Its sides sustain the axle and are supported or joined by an intermediate part or bottom, which forms a tight case, into which the oil is put, so that the friction wheel dips into it, and its rim carries up a little of it continually to the rubbing and rolling surfaces, returning it to the reservoir; thus oiling its own axle where all the rubbing is situated, and the rolling axle, and no more is *consumed* than *evaporates.* Its enclosure keeps it clean.

I need not remind you that the use of oil on axles is not only to keep the surfaces from absolute contact, and grinding together, but to keep them cool, and this is better done by the successive application of new portions of oil, than by keeping the same oil on the axle as long as it will last, partaking of the heat the axle acquires, and therefore evaporating the faster. This method must therefore be of consequence when great velocity is to be given to heavy loads.

Respectfully, yours, &c.

J. L. SULLIVAN.

FRANKLIN INSTITUTE.

Monthly Meeting.

At a stated monthly meeting of the Franklin Institute, held at their Hall, July 28th, 1831.

THOMAS FLETCHER, Esq. Vice President, in the chair, and ALGERNON S. ROBERTS, Secretary, *pro. tem.*

The minutes of the last meeting were read and approved.

The following donations were presented to the Institute.

By Mr. Robert S. Gilbert.

The Cabinet of Natural History and American Rural Sports.

By Messrs. Carey & Hart.

The Working Man's Companion. The Results of Machinery, namely, Cheap Production and Increased Employment exhibited; being an Address to the Working Men of Great Britain.

The corresponding secretary laid upon the table the following works received in exchange for the Journal of the Institute—

London Journal of Arts and Sciences, for June.

The Repertory of Patent Inventions, for April and June.

London Mechanics' Magazine, for May.

The Register of Arts and Journal of Patent Inventions, for April and June.

Recueil Industriel, for February.

Bibliothéque Physico-economique, for April.

Annales de Chimie et de Physique, for January.

North American Review, for July.

American Annals of Education and Instruction, for July.

Museum of Foreign Literature, Science, and Arts, for July.

American Journal of Geology and Natural Science, for July.

The Illinois Monthly Magazine, for June.

The committee on Inventions presented a report on D. L. Smith's planeing machine, which was read, and, on motion, referred to the committee on publication.

On motion, the subject proposed for discussion this evening was postponed until the next monthly meeting, and then adjourned.

THOMAS FLETCHER, *Vice President.*

ALGERNON S. ROBERTS, *Sec. P. T.*

Report of the Committee on Inventions, of the Franklin Institute, on DANIEL L. SMITH'S *Revolving Timber Plane.*

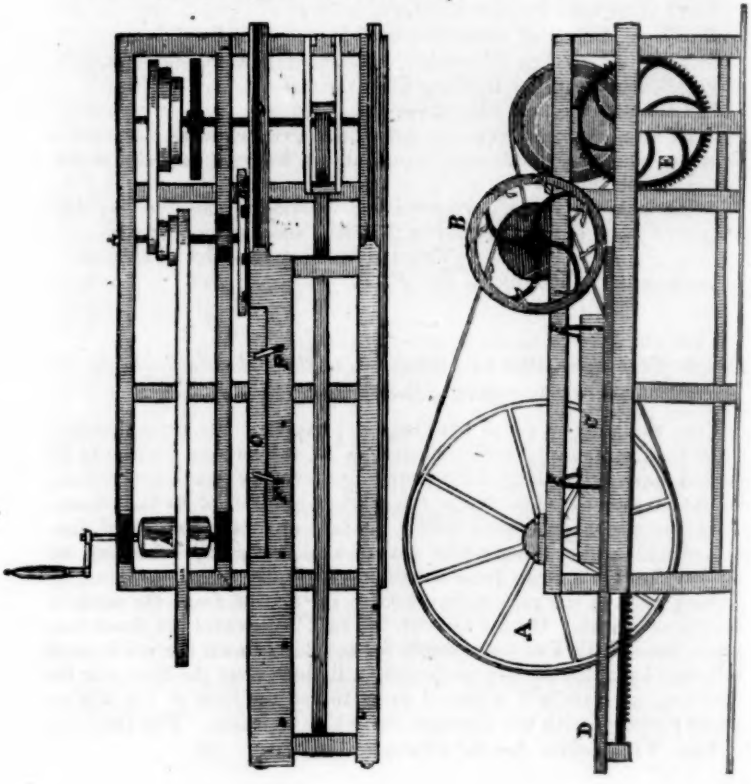
THIS machine, of which drawings and explanations are appended, consists of a frame of sufficient length to support the timber to be planed, having a sliding carriage upon it moved by a rack and pinion, on metal guides, upon which the timber is secured by hold-fasts. This frame is made to pass before the face of a cast iron wheel, furnished with plane irons, which revolves with rapidity, receiving its motion through a strap from a belt wheel in the hand machine, or driving pulley; the rack pinion taking its motion from the shaft of the plane wheel. On the face of the cast iron wheel are fixed four plane irons. Two of them single for roughing down the work, each followed by a double iron projecting a little beyond the first pair for finishing, all carefully adjusted so as to cut the face of the timber exactly square with the carriage on which it rests. The roughing

irons extend further from the centre of the wheel than the other pair, and their ends made round with cutting edges to enable them to take off any projections on the wood which could not be removed by the faces, and reduces the wood, at one operation, to the full breadth of the iron, say from half an inch to one inch. To cut the timber to any bevel it must be set on the frame to the required angle, and secured by wedges on the outside.

This machine differs from Woodworth's, inasmuch as the cutters are secured to the face of the wheel, instead of the periphery, and is not furnished with secondary planes for tongueing and grooving.

The committee witnessed several trials on a model which was laid before them, and afterwards on a large machine in Kensington, where it performed its work with expedition and accuracy—the timber was square maple and cherry, from which the irons at once cut a chip three-fourths of an inch thick. As the cutters move across the grain of the wood, it is probable that unless the edges are kept exceedingly sharp, smooth work could not be performed on soft spongy wood, but they recommend it as a valuable addition to the machine maker's shop, or to others who work in the harder woods.

Philadelphia, August 25, 1831.



AMERICAN PATENTS.

LIST OF AMERICAN PATENTS WHICH ISSUED IN APRIL, 1831.

With Remarks and Exemplifications, by the Editor.

[* Continued from p. 127.]

55. For an improvement in the *Grist Mill,* called a self-stopper; Robert M'Cormick, Jr., Augusta county, Virginia, April 20.

Within the ordinary hopper, there is a secondary, or false hopper, exactly fitting the former on every side; this false hopper is placed at the lower part of the true one, and may extend up, probably, one-third of its height. The false hopper is attached to a cord, which passes over a pulley with a weight sufficient to raise it when not held down by the grain within it. When nearly all the grain has run out of the hopper, the weight descends, and by a connexion established between it and the gate arm, stops the mill.

The claim is to "the false hopper, the lever, &c. by which it is suspended, the weight, as constructed, and the channel in which it plays up and down; the horizontal rod as connected to the shoe, and the combination of the several parts."

---

56. For a *Washing Machine;* John Hale, Hollis, Hillsborough county, New Hampshire, April 20.

We really believe this to be a washing machine of a new construction, which, numerous as are the patents taken for such instruments, is a thing of rare occurrence. A washing tub is to be made in the form of the troughs of those mills for grinding apples, bark, and other articles, in which a stone rolls round. In other words, take a tub three and a half feet in diameter, and another of two feet in diameter, place the last within the other, bottom upwards, and you have the form of the annular washing tub described in the specification. A vertical shaft is to pass through the centre of this tub, and to be supported by pivots, in a proper frame, so that the tub will revolve freely in a horizontal direction. A roller of 18 inches in diameter is fixed upon a shaft in the frame, and when turned by a crank it revolves within the annulus, or circular trough, touching its bottom. This roller is the frustrum of a cone, to which the bottom of the trough is adapted to cause it to act regularly. The lower pivot of the main shaft rests upon a moveable lever, under the tub, and is sustained by a weight, or spring, to allow the tub, as it revolves, to adapt itself to the varying thickness of the clothes. The motion is to be slow, to effect which a pinion on the crank shaft takes into a wheel on the shaft of the roller.

The claims are to "the annular form of the tub, with its advantages of rising and lowering according to the irregular thickness of the clothes spread therein to be washed; and the advantages obtained by the speed of the washer, which facilitates the operation."

57. For an *Upright Toggle-joint Press;* John Hale, Hollis, Hillsborough county, New Hampshire, April 20.

This is a standing press, with a bed piece, cheeks, and caps, made in the usual manner. There are two toggle-joints attached by their upper ends to the cap piece, and by their lower ends to the platten, or follower, the knees of the joints receding from each other: when in use they are to be drawn together by a rope, for which purpose they have sheaves fixed in the joint pieces, running upon pins within mortices made in them; through these a rope is reeved. A windlass attached to one of the cheeks of the press is used to draw this rope. The claim is to the application of the several pulleys, or sheaves, to the toggle-joints; and the application of ropes."

There are but very few objects to which such a press is applicable. The toggle-joint being peculiarly adapted only to the purpose of traversing a small distance, with the exertion of immense power at the end of its short range. Where goods are to be pressed the conditions are very different, and such as this press will not fulfil.

---

58. For a *Polishing and Graining Machine,* for Morocco and other leather; Robert Emes, Boston, Massachusetts, April 20.

A wheel, which may be of iron, and eleven feet in diameter, is made to revolve upon gudgeons, like a fly wheel; a stout base, or foundation of stone, lies under this wheel, a part of it being cut into the form of a segment suiting the diameter of the wheel. This part may be faced with iron, and forms the bed upon which the leather is to lie, in order to its being diced, or polished. The flints for polishing, or the blocks for dicing, are fixed upon six rods upon the periphery of the wheel; these rods slide in sockets so that they can retreat, and are borne out by spiral springs, that the requisite pressure may be made upon the leather.

"What I claim herein as new, and of my own invention, is the wheel aforesaid, with the apparatus thereto fixed when applied for holding and carrying a flint polisher, and operating therewith on morocco, or other leather, to polish the same, and for holding and carrying a dicing ball or block, and operating therewith upon morocco or other leather, to dice or grain the same, and the flint when used and applied as aforesaid, with the said wheel and its apparatus for holding the same, for the polishing of morocco and other leather."

At p. 200, vol. 3, there is an account of a similar machine, patented by Abel Bayrd, of South Reading, Massachusetts, on the 29th of December, 1828. If there is any thing different in the principle of the two machines, we are unable to discover in what this difference consists. The last mentioned patentee refers to one obtained by Mr. Jacob Perkins, in the year 1809, for the same purpose, which he in part adopted, taking his patent for an improvement thereon.

---

59. For a *new Material for Sheaves of Blocks;* Caleb Curtis and Thomas C. Smith, Boston, Massachusetts, April 20.

"The stone ware sheave, made of clay, and the materials usually

employed in the glazing of stone ware, pottery, or glass ware, to be used in the same manner and for the same purposes as lignumvitæ and iron sheaves are now used."

These sheaves are undoubtedly very good, when well made; this, we believe, has been proved in England; as we recollect sometime since, seeing them mentioned in one of the journals; although this fact may militate against the validity of the patent, it will not affect the goodness of the pulley.

---

60. For a *Churn;* David Smith, near Emmitsburg, Frederic county, Maryland, April 21.

A trough is made, the excavation in which is to be semi-cylindrical. In this trough dashers are to revolve backward and forward, they being fixed upon an axle for that purpose. A cover is to be keyed down over the dashers, to prevent the waste of cream. It is to be worked by a lever, there being a pinion on the dasher shaft, and a segment of a wheel on the fulcrum of the lever. The claim is to "*the mode of keying the top to the bottom;* the inclined dashers, and the mode of working them."

---

61. For an *Improvement in the Power Loom;* Jesse Taylor and Joseph Woodhead, Middletown, Pennsylvania, April 21.

The exact structure of the part patented, cannot be given without a drawing; but its object and operation are thus explained:

"When the thread of the filling or weft breaks, the spring acts by the lathe's striking against the breast beam, and the finger [a part so called] pressing on the lever, lets off the gearing rod, and suffers it to slide along the mortice; it then throws the strap from a fixed to a loose pulley; thus stopping the operation of the weaving."

The claim is to the "stopping of the power loom when the filling breaks, by the machinery itself, without the aid of hand."

---

62. For an *Improvement in Tanning;* Isaac Daws, Goshen farm, Montgomery county, Maryland, April 21.

The directions given are, after the hides have been haired and fleshed, to hang them in bates, upon pegs or nails, very close together, until fit to work in the bark: clean and rince them, hang them in tan vats upon pegs or nails, in a weak sour liquor, for two or three days; hang them next in a stronger liquor for four or five days. Make a very strong liquor of black oak bark; for a vat of thirty hides, add one pound of Glauber's or other salt; add three bushels of bark at the bottom, and one at the top of the vat; in this hang the hides for three weeks, covering the vats up to prevent evaporation.

On removing the hides, the liquids will answer as weak liquids.

The claim is to the foregoing process, by which leather can be tanned in less time, with less labour, and be equally good with that tanned in the ordinary way.

---

63. For a *Washing Machine;* John G. Conser, Miles township, Centre county, Pennsylvania, April 21.

There is no claim to this machine; and it is so old fashioned, that we have met with it repeatedly, and do not, from our acquaintance with it, think it worth introducing again to our friends.

---

64. For an improvement in *Teaching the Art of Performing on the Violin;* Robert M'Cormick, Augusta county, Virginia, April 21.

Not being adepts in music, we will not attempt a particular analysis of the merits of the plan before us. The specification refers to three musical scales, which are delineated in it, and which we do not think it necessary to give. These scales are to be let into the finger board, by dovetails. They have frets across them at each semitone, so that when the string is pressed by the finger, it is stopped by the fret, as in some guitars, a little variation of the finger not affecting the note. These scales may be changed. One of them is for pieces keyed on D major. One on the minor scale, and the other for pieces on C major.

Besides these scales, there is what is called a tuning scale, or block, which is to be slipped into the place prepared for the scales. It has projections rising on it with notches to receive the strings alternately. The object, if we understand the description, is to stop the string at such a part as shall enable the performer to tune it, by making it sound the same note with the preceding string. Thus, when the treble, or E string, is raised to the desired height, the second, or A string, is placed in the notch intended for it, and strained till it produces the same sound with the treble, and so on.

The claim is to the three main scales, and the tuning scale, or block.

---

65. For a *Thrashing Machine;* Andrew Richison, New Carlisle, Clark county, Ohio, April 22.

This thrashing machine has a cylinder and concave of the ordinary construction. As the straw passes from the concave, it is taken hold of by a revolving rake, with four arms, and teeth on cross pieces, the grain falling out underneath.

"The *invention* here claimed, is the construction and arrangement of the several parts of the machine; but particularly the mode, before described, whereby the grain is separated from the straw, and the latter thrown out by the revolving rake."

Should nothing be retained, either in general, or in particular, but what is new, the remaining part of this machine would occupy a very small space.

---

66. For an improvement in *Horse Shoes;* John Dietz, city of New York, April 22.

The shoe is to be made bevelling from the inner towards the outer edge, and is to be considerably thicker than ordinary.

"By this method of construction, the shoe is prevented from clog-

ging with ice or snow; and being of a uniform thickness, sets easier to the foot of the animal, and on account of the pressure being equal on all sides, is far more durable than the common horse shoe."

Instead of a groove for the nail heads, countersinks are made, and nails suiting them pass in flush.

---

67. For an improvement in the *Horizontal Square Piano Forte;* Ebenezer R. Curcier, Boston, Massachusetts, April 22.

The objects claimed to have been accomplished by this improvement are the following: The making each hammer strike one or more strings, as in the grand piano forte; for which purpose the hammer rail is made to shift by means of a pedal. The placing the key board exactly midway of the instrument, giving a compass of seven octaves, and preserving greater symmetry and beauty than by the ordinary arrangement. The running of the braces very near to the strings, thus attaining great strength and lightness, with the property of keeping in tune.

As these advantages depend principally upon the arrangement of the action, a drawing would be necessary to their explanation.

---

68. For the application of power to the *Extracting of Stumps of Trees;* Willard Foster, Oswego, Tioga county, New York, April 22.

A straight post of about nine feet in length, with a cross piece of timber morticed on to its lower end, to prevent it from sinking into the ground, is placed at the distance of about two feet from the stump to be raised; its upper end is to incline so as to stand over the stump. A chain, one end of which is firmly attached to the stump, passes over, and rests upon the upper end of the post first mentioned; the other end of the chain is to be fastened round another stump, or any convenient fixed object. If this chain be then shortened by any means, and all the attachments be secure, the stump will be raised. This shortening is proposed to be effected by means of a tackle attached to the chain, drawing it laterally; or by means of a long lever with chain and hooks near to one end of it, which hooks may be so attached to the main chain, that by twisting the lever it may draw forcibly upon them.

There is no claim made, but we are told that "the power may be applied to extracting stumps, raising weights, drawing up vessels, moving buildings or other ponderous bodies, and such part of the machine, or the whole, applied, as will effect the object."

As no new power, or machine, is brought into action, but means resorted to which have been heretofore applied in various ways, we presume it would have been best to have confined the description to the raising of stumps, because it is probable that such part as has been heretofore employed for other purposes, may still be freely used.

---

69. For an *Ink Holder;* Daniel Harrington, Philadelphia, Pennsylvania, April 22.

This is an ingenious contrivance for regulating the height at which the ink shall stand in the vessel containing it, and for securing certain other advantages; as this ink holder consists of several parts, tending to the attainment of the same ends, its structure cannot be fully explained without the aid of a drawing.

The ink is contained in a cylindrical chamber, in the part which may be denominated the ink stand. A second chamber is provided into which the ink is to flow from the first, there being a lateral opening from one into the other. A cylindrical cup, or box, screws into the first chamber, and may be readily made to press upon the surface of the ink below it. When depressed, the ink rises in the second chamber, and when raised, the ink in this second chamber is depressed, and it is evident that its height may be thus regulated. Another cylindrical cup screws into the second chamber, which is also capable of being raised or lowered as desired. Into this cup the pen is to be dipped. A disk of cork is placed within it, against which the end of the pen is to touch, preserving it by its texture from any injury.

---

70. For *Cast and Wrought Iron Mill Spindles, and a Cast Iron Driver;* James Barton, Milford, Pike county, Pennsylvania, April 23.

"The improvement in the cast iron mill spindle consists in casting it with a square or round hole in the bottom of the spindle, about three inches in depth, into which is to be inserted a cast iron, or wrought iron and steel foot, on which the spindle turns. The length of this point or foot is about seven inches, and it is to be so fashioned as easily to slip in and out." "The improvement in the wrought iron spindle is similar to the cast iron above described, having a hole punched in the bottom into which is to be inserted a cast iron, or wrought iron and steel point or foot that may be put in or taken out at pleasure."

Under the drivers there is to be a collar of cast iron, about five inches long, and four and a quarter in diameter. It is to be slipped on a square upon the spindle, and rests upon a shoulder prepared for it. The driver, resting upon the collar, is to be of cast iron.

---

71. For a *Machine for giving Motion or Exercise to Invalids,* in their own Rooms; Daniel Harrington, city of Philadelphia, April 23.

The general form of this instrument, or machine, may be that of a sofa, arm chair, or other kind of seat, or lounge. These may be placed upon rockers, similar to those of rocking chairs. The seat of the chair, or other vehicle, instead of being supported, and connected to the rockers by legs, are sustained upon springs; which are usually of an elliptical form, or that of a double bow; there is a series of these springs, one above the other, and properly connected by their middles. They may be hidden by drapery, and the whole apparatus

assume an elegant appearance. The number of pairs of springs may vary, but from three to five on each side will operate most agreeably.

The invention claimed is to the application of springs to a health vehicle, for the purposes described; these springs may be varied in form; grass-hopper springs, straight springs, connected in a proper manner, and others may be employed for the same purpose.

The vehicle may be moved by the invalid; or when necessary, the motion may be given by an attendant, and the force of it may be regulated according to circumstances, so as to imitate the exercises of walking, trotting, or galloping.

---

72. For a *Machine for separating Gold from Earth*, and other substances, being an improvement on the Rocker and inclined Plane; Green B. Palmer, Burke county, North Carolina, April 23.

"As to my claims of the improvement on the rocker, they are—

"1st. Forming the rocker, containing perforated iron plates in such a way, that the sand, gravel, &c. can then be thrown in at the upper end by moving the handle, or lever, from the head to the middle, or elsewhere, so as to be out of the way of the workman at the head.

"2nd. Putting into the rocker, underneath the perforated iron plates, inclined planes, with bars or stops across them, so as to detain quicksilver, and so constructed that the whole must be in constant motion, together with the earth, sand, water, quicksilver, gold, &c.

"3d. The invention of the lever and knocker in the middle, so as to strike on the springs at each vibration.

"4th. Poising the machine on pivots, points, or gudgeons, so as to support the weight.

"5th. The process of locking in, either by bars across the perforated iron plates, or as a drawer at the head.

"6th. The principle of the motion used in the inclined plane beneath the perforated plates, for fanning out."

"7th. The principle of the spring on which the jarer, or knocker, works.

"8th. The improvement of the inclined plane, or riflers, with stops across them, from the notched log, or gutter."

We have given no more than the claims to the foregoing machine. The whole specification is of considerable length, and would not be intelligible alone, or interesting to many of our readers.

---

73. For an improvement on the machine for *Splitting Leather;* Alpha Richardson, Boston, Massachusetts, April 23.

This is an improvement upon "Parker's machine." It is one of those which would require a plate for its illustration. We are told that "all the improvements are clearly and distinctly shown on the *accompanying model.*" The proper place is the *accompanying drawing*, when the law is taken as a guide.

74. For an improvement in the process of *Dressing Woollen Cloths*, and cloths composed partly of wool, and partly of cotton; Calvin W. Cook, Lowell, Middlesex county, Massachusetts, April 23.

(See specification.)

---

75. For an improvement in *Rail-road Carriages;* William Howard, Civil Engineer, Baltimore, Maryland, April 23.

(See specification at p. 391 of the last volume.)

---

76. For a machine for *Thrashing Grain and Clover*, mashing and grinding grain, and for hulling and smutting it; Orange Dean, Jr., and Joseph Woodhull, Caladonia, Livingston county, New York, April 25.

The cylinder of this machine is to be covered with plates of cast or wrought iron, having teeth upon them, resembling saw teeth. The concave is to surround the cylinder, for one-half of its circumference. The teeth of the cylinder are not to reach within three inches of its ends, and curves of wood are to be fitted to these smooth parts, sustaining the hollow segment at a due distance from the cylinder. The concave, instead of teeth, is to be furnished with vertical grooves. A vibratory motion is to be given to the cylinder; this is to be effected by means of a wheel on the shaft of the cylinder, which has on it a zigzag groove, or fillet, which serves to guide a lever connected with the concave, to which it communicates a motion of about two inches backwards and forwards, lengthwise of the cylinder. For clover seed, the teeth and grooves are to be smaller than for grain.

When used for mashing or grinding, hulling or smutting, the concave is to contain teeth instead of grooves. Sieves, screens, &c. may be added, and shaken by the zigzag.

The claim is to the principle of the lateral, or backward and forward, movement; and to the other parts which, though not new in themselves, are new in their general arrangement.

It seems to us that what is here patented can scarcely be called *a machine*, but is rather two or more machines, as when used for the different purposes designated, the same instrument will not answer the intention; but parts, if not the whole of it, have to be changed. If the same machine would apply to all the purposes designated, a patent for the machine might legitimately include its application to the whole of them.

---

77. For *Dogs for Saw Mills;* Anson Andrews, Spencer, Tioga county, New York, April 26.

The patentee says, "What I claim as my improvement is the manner of shifting the gauge dog on the square bar, and the manner in which it is made, also the screw that passes through the eye against the end of the bar, to shift the bar to the exact thickness of

the lumber; also the dog that holds the log on the other end of the tail block, through which passes an angle dog, together with the hand that is fixed on the upright part of the half bail, and the manner of lengthening and shortening it."

There is a drawing, but it is without "written references."

By turning back to our list of patents for 1830, it will be seen that four patents were granted in the course of three weeks for dogs for saw mills. One on the 19th of February, one on the 10th of April, and two on the 13th of April. That on the 10th of April was obtained by the same person to whom the above has issued. The claims in both cases are so similar, as to make it appear that some of those points now claimed were included in the patent of last year, which is altogether inadmissible, as there cannot be two valid patents for the same thing. The present, we apprehend, should have been taken for an improvement, merely, on the former patent.

---

78. For a *Thrashing Machine;* Joshua S. West, Portland, Chataque county, New York, April 26.

The "cylinder" and concave meet us, as usual, with this difference, that the *cylinder* is a *cone*, or rather, is made conical, its diameter at one end being an inch greater than at the other. Bars of iron pass from end to end of it, running spirally.

"To this machine is added a hopper, or feeder, which receives English grain in loose bunches, the heads of the grain at the largest extremity of the cylinder, and the butts of the straw at the smallest extremity. As the cylinder is tapering, and the bars of iron on it run spirally, the straw passes through quartering, in consequence of which the machine clears itself light and easy, and does not become choked as is the case with machines where the straw passes through endwise."

There is no claim made, yet certainly the whole machine is not new. The conical form of the "cylinder," we believe to be so.

---

79. For a *machine for Thrashing Grain*, shelling corn, and grinding apples; Alonzo L. Smith, Weedsport, Cayuga county, New York, April 27.

This machine, which is to fulfil three several purposes, is in fact three several machines, for which one common frame will answer, and which may be driven by the same motive power. There is a thrashing cylinder, with twisted iron bar beaters, and a concave bed. Another cylinder, set with teeth in the old fashioned way, for shelling corn, and a concave bed, with a spring, against which it is to operate. A third cylinder, and its bed, are set with teeth, for grinding apples.

In the corn shelling machine the claim is to "the shape, form, action, and, finally, all its most essential parts."

"In the grinding apples, all except the teeth, the shape of the cylinder, and its being propelled by horse power."

"In the grain thrashing part, all except the use of square bars in the bed, shape of the cylinder, and manner of propelling. And, further, the great advantage of *one* machine answering three purposes." There is certainly some mystery in forming one machine of three.

---

80. For a *Thrashing Machine;* Edmund Warren, city of New York, April 27.

The cylinder is to be banded with iron from end to end, and is to have teeth; the concave is to be like other concaves; the frame supporting the cylinder is in the form of an equilateral triangle, resting on one of its sides; the claim is to "the wrought iron hooped cylinder with spurs; the particular form of the frame, to give great strength with little expense or workmanship; as also the inclined springs for the concave, with the mode of changing them by screws, for corn."

---

81. For a *Saw Trimmer;* John R. Failing and Robert G. Nellis, Canajoharie, Montgomery county, New York, April 27.

This is a machine for what is sometimes called gumming saws. It is merely a steel punch, sliding in a socket, with a bed below it, upon which the saw is to be laid. When used it is to be placed upon an anvil, or other solid body.

Which of our mechanists will point out the novelty of this invention? The saw maker certainly will not.

The claim is to the exclusive privilege of using this machine.

---

82. For a machine for cutting or *shaving Smoked Beef or Cold Slaw;* Henry Bangs, city of New York, April 27.

The old cutting knife and board, for cutting cold slaw, is to be fixed so that the edges of the board may slide up and down between two vertical posts. There is to be a piece of timber on which to rest the beef, or cabbage, and a box below to catch the cuttings. The claim is to the foregoing machine.

---

83. For a machine for *Dubbing, or Dressing, of Ship Timber,* knees, plank, &c.; John Judge, Navy Yard, Washington, District of Columbia, April 27.

The timber to be dressed is to be fastened on to a carriage by suitable screws. The carriage may be made to advance by means of a rack and pinion, like a saw mill carriage. A wheel, or wheels, with cutters, is made to revolve, by the application of any sufficient motive power. There may be two cutter wheels on the same shaft, one operating upon each side of the timber which is embraced between them. These may be adapted to any thickness of stuff by making them advance towards, or recede from, each other, by means of a screw on the shaft, or a groove and key, in ways well known to workmen.

The claim is to "the application of cutters on the periphery of wheels, to the hewing, dubbing, or dressing of ship timber, plank,

knees, &c. &c., with the manner of fastening the timber to the carriages; and also the manner of adjusting the wheels to the different thicknesses of timber."

This is a machine well calculated to facilitate labour in the way designated; and to effect its purpose with much greater truth than is possible by hand. The patentee is a skilful workman at the Navy Yard in this city, who has introduced several valuable machines, and modes of procedure at that establishment, by which the public have been much benefitted; but, we believe, without that recompense to which his real merit justly entitles him, and which he probably would have obtained had he been out of the service.

---

84. For a self acting fulcrum, screw, or spiral lever, for *propelling Vessels, and Rail-road Carts*, &c. &c.; John James Giraud, city of Baltimore, Maryland, April 27.

(See specification.)

---

85. For a machine for *Gumming Saws;* Phineas Newton, Sidney, Delaware county, New York, April 29.

This machine consists of a lever with a long and short arm, the short arm forcing down a steel cutter upon a steel bed, the latter having an excavation adapted to the tooth, and the end of the cutter fitting into this excavation. There is no claim, nor any thing novel in its mode of operation. Besides the patent above noticed, for the same purpose we have previously recorded three or four others, all of them operated upon by levers. Why does not some one patent the application of the screw to gumming saws?

---

86. For a method of *Amalgamating and Washing Residuums, or the Gold and Silver Ore*, pulverized, or calcined, in their first state, to extract the gold or silver; James Lewis Montaudevert, Charlotte, Mechlenburg county, North Carolina, April 30.

The residuum of ore that has been ground, and, if necessary, calcined, is to have the metal which may have escaped the first amalgamation extracted by the process described.

The residuum after having been dried, is to be moistened with a portion of common salt, put into a wooden trough with quicksilver, and pounded. About ten per cent. of quicksilver will be required. The mass in the trough should not exceed four inches in depth.

To collect and unite the quicksilver, an iron or copper washer, like a soap boiler's kettle, is to be used. It must be of ten times the capacity of the residuum. This washer is to be placed over a furnace, a large surface being exposed to the action of the fire. It is to be nearly filled with water, which is to boil for thirty minutes. The quicksilver will be found in globules at the bottom, after the fire has been removed. The finer particles, which sometimes float, are to be beaten down by a shower of cold water, or by a spatula.

The fluid is to be drawn off into successive receivers, furnished with spouts like those of tea kettles, delivering it from one to the other. In these successive receivers the floating quicksilver is to settle; and the quicksilver collected from the washer, and the successive vessels, is to be used with other residuums, until it is sufficiently saturated with the gold or silver.

It is said that this process is more economical than those heretofore employed: that little or no quicksilver is lost, and residuums which would not bear an expensive process can consequently be used.

The washing with boiling water; the precipitation by a shower bath of cold water; the collecting the floating particles in successive receivers; the repeatedly using the same quicksilver until sufficiently saturated, and the application of the same process of washing, constitute the claims.

---

87. For an improvement upon a *Water Wheel for propelling Boats*, for which a patent was obtained on the 22nd day of December, 1818; Asa Waters, Millbury, Worcester county, Massachusetts, April 30.

The buckets are made to swivel upon pins on their ends, working in arms. There are cams for locking and unlocking them, the intention being that the buckets may "always strike the water at a proper angle for obtaining most power, and have no back water to raise; because, when the buckets are brought to a certain position or bearing in the water, the cams at the bottom of the wheel press on the levers and unlock the floats, and let them swing loose on their pivots; and at the same time the floats at the top are locked by the same means; thus producing a maximum of power in the wheel."

We have not heard that the wheel, as first patented, has been brought into successful operation; nor do we anticipate that with the improvements it will make its way as well as the common paddle wheel. We expect but little from swinging buckets in general.

---

88. For a *Thrashing Machine*, called the "twin cylinder and double concave thrashing machine;" William E. Osborn, Brighton, Monroe county, New York, April 30.

There are, as the name indicates, to be two cylinders and two concaves. The cylinders run close together, a line joining their axes forming an angle with the horizon, of about 45 degrees. The teeth in the cylinder, and the bars forming the beaters, are similar to some formerly patented, although they are here claimed as new. The two, or more cylinders, and concaves, are also claimed.

---

89. For a machine for *Grinding, Levelling, and Polishing Plates of Metal*, and other hard substances; William J. Stone, city of Washington, District of Columbia, April 30.

(See specification.)

LIST OF AMERICAN PATENTS WHICH ISSUED IN MAY, 1831.

With Remarks and Exemplifications, by the Editor.

1. For improvements on a machine formerly patented by Amos Whittemore, for *Cutting the Teeth, Pricking the Holes, and Setting the Teeth in Filleting Cards;* Reuben Meriam, Leicester, Worcester county, Massachusetts, May 2.

"The improvement consists in effecting the side motion of the carriage which holds the leather, in a more gentle and perfect manner, so that the operation may be greatly accelerated, and the machine at the same time be less liable to get out of order."

How this is to be accomplished we shall not attempt to describe, the complexity of the machine rendering any such attempt useless, excepting to those few who are perfectly acquainted with the structure of this ingenious instrument, as at present made.

---

2. For an improvement in *Distilling;* James L. Jenks, Sackett's Harbour, Jefferson county, New York, May 2.

(See specification, p. 321, of our last volume.)

---

3. For an *Apparatus to be connected with, and to form part of, a Steam Engine Boiler;* Philo C. Curtis, Utica, Oneida county, New York, May 3.

(See specification.)

---

4. For a machine for *Cutting Grass and Grain;* William Manning, Plainfield, Essex county, New Jersey, May 3.

(See specification.)

---

5. For an improvement in *Stoves to be heated by Stone Coal;* Urban B. A. Lange, city of Philadelphia, May 3.

The grate in which the coal is to be burnt, is not within the stove, but is connected to it by a horizontal flue leading into the lower part of it. The stove consists of several compartments, all of which are to be heated by the flue through which the heated air is to pass, such a direction being given to it as is adapted to the purpose.

The particular arrangement adopted is represented in the drawing. The claim is to "the construction of said stove, and the application of stone coal to heat the same."

---

6. For a *Machine for Grinding Bark;* Merrit Hurd, Augusta, Oneida county, New York, May 5.

This bark mill is not very distinctly described, but the patentee appears to consider it as new in nearly all its parts: he says, "I claim as my own invention all parts of the said machine except the teeth in the hoops;" these hoops we will presently describe. As re-

presented in the drawing, most parts of this machine appear to resemble such as are well known, and have been long used.

The shaft stands vertically, in the usual manner, and carries a conical nut, furnished with teeth, for breaking the bark, which is contained within the surrounding rim. Below the conical part of the nut, it assumes a cylindrical form, and is furnished with teeth, as usual: this is the part called the hoop; it is to be made of cast iron, in segments, screwed on, and capable of being renewed, as the teeth wear out. This construction of the hoops is claimed as new.

---

7. For an improvement in the *Apparatus and Mode of Drawing Soda Water;* Justus Perkins, Brutus, Cayuga county, New York, May 3.

A vessel of tin or other material is to be made, and divided into two parts by a partition across. A cock is to be inserted into this vessel, the tube of which, behind the key, is to be divided into two parts by a partition corresponding with that of the vessel; one of the parts opening into one division, and the other into the opposite. When the key of the cock is turned, the fluid flows from each division, and the two portions unite in the common orifice of the cock.

The two parts are "the one to hold the soda, the other the tartaric acid," about which two articles nothing had been previously said; it would appear, therefore, that the patentee supposes that what is usually called soda water, is prepared from these two ingredients, whilst the fact is that neither of them, ordinarily, enters into its composition; the so called soda water, being merely water impregnated with carbonic acid. The liquid in question is one form of the well known effervescing mixture of the physician; citric acid, however, being most commonly used for this purpose. The liquid is in fact a solution of Tartrate of soda. The claim is to the apparatus employed.

"What I claim is the before described apparatus for, and mode of drawing soda water, by means of a compound cock or fasset."

---

8. For an "*improved Plantation Mill*" for grinding of Grain; John Anderson, Louisville, Jefferson county, Kentucky, May 3.

This patent is taken for making the husk, and the frame work, generally, of cast iron. "The inventor claims as new the application of this material (cast iron) in its various forms to this purpose, believing it to be exclusively his suggestion; and as better adapted to this purpose than any material hitherto used," &c.

Cast iron will undoubtedly make a solid frame work and foundation for such a mill; but whether the mere use of this material will prove to be as secure a foundation for a patent, may admit of doubt.

---

9. For *making Mould Candles* by means of a machine for supplying and cutting the wicks, and drawing the candles from the moulds; which he calls "The Candle Drawer, and Endless Wick Nipper; Thomas Hewitt, jr. city of Philadelphia, Pennsylvania, May 4.

The moulds are to be fixed in a mould bench in the usual way, with their smaller ends downwards. The mould bench is placed between two uprights, forming a part of the machine. The moulds must be securely fixed, as the candles are to be drawn without removing them. Below the moulds there are spools or balls of yarn, formed of wick of the size desired; one of these is to be drawn through each mould, and passed out above it; the wicks are all confined to strips, called nippers, which extend from post to post, the whole length of the mould bench. These nippers hold the wicks exactly over the centres of the moulds, and stand at a sufficient height above the tops of the moulds to allow of the pouring of the tallow. The ends of the nippers rest upon racks which rise vertically within the posts, and after the tallow has been poured and has set, a crank is turned, which, operating upon pinions, raises the racks, and draws the candles from the moulds. As this is done, the wick is at the same time drawn into each mould, ready for a new set of candles. A sufficient length of wick is allowed above the moulds to attach other nippers, after which the wicks are cut off above these last nippers, the candles first drawn removed out of the way, the racks lowered, and the whole operation repeated.

Some modifications of this apparatus are described, and a claim is made to the machinery in general.

---

10. For an improvement in the *Making of Boots and Shoes;* Caleb A. Ore, city of Philadelphia, Pennsylvania, May 5.

"What I claim as my own invention, or discovery, is in the uppers, to wit, in making boots with one seam, and shoes without any seam."

For boots, the leather is to be strained into proper form on a crimping board, so as to require a back seam only. For shoes, the leather is to be cut for a whole upper, a hole being made for the instep. This leather is then to be wetted, and rubbed, and crimped upon a last. Slippers, shoes, and Jeffersons, are to be made in this way.

---

11. For an improvement in the *Piano Forte Action;* John F. Nunns, city of New York, May 5.

"The new principle claimed is the action of a lever in front of the hammer butt, instead of behind it, as in the ordinary method of construction: by this method a single key may be withdrawn, without deranging the rest of the action. The hammer is constructed similar to the ordinary plan, with its shaft attached to the butt, which is secured and moveable by means of a hinge or pivot to the rail."

The drawing represents the action as applied to the horizontal grand or plain instruments, exhibiting the whole arrangement in a very perfect manner.

---

12. For an improvement in *Medicine;* Joseph Baker, Jefferson, Ross county, Ohio, May 5.

(See specification.)

13. For a *Butter Churn;* Joseph Crail, Warren, Trumbull county, Ohio, May 5.

A vertical shaft is to have slats or dashers extending from it; the shaft is to run in a pivot on the bottom of the churn, and to be supported at top by a collar. The shaft is to receive a whirling motion by means of a bow and cord, exactly in the manner of the small table churns in very general use in France, and not unknown with us. The patentee says: "What I claim as particularly new, and of my own invention, is the manner of moving the shaft or dasher by a bow and strap."

It unfortunately happens that this particular novelty, as we have above indicated, is very old, although to the patentee it may appear quite otherwise.

---

14. For an improvement in the mode of *Commencing the Generation of Gas,* in the Self Generating Gas Lamp, patented on the 15th of April last, by means of a Spirit Lamp filled with alcohol, or other highly inflammable fluid; Solomon Andrews, M. D., Perth Amboy, New Jersey, May 5.

(See specification.)

---

15. *For applying Animal Power to sundry Mechanical Purposes;* William E. Arnold, Chatham, Middlesex county, Connecticut, May 7.

The power of animals is to be applied by allowing them to walk upon a moveable inclined plane, sustained by rollers, in a way well known. Three or four different modes of constructing the moveable floor are described, but not very clearly; it is calculated by the patentee, however, that his improvements will greatly increase the power derived from the weight of the animal; from what cause it is likely to produce this effect, we have not been able to ascertain.

---

16. For a *Thrashing Machine;* Samuel Fahrney, near Boonsborough, Washington county, Maryland, May 9.

The beaters and bed, or hollow segment, the feeding table, and in fact all the operating parts of this machine, have their counterparts in numerous others; the *invention* of the patentee consists in the mode in which the cast iron beaters are fastened to the heads upon the revolving shaft.

"What I claim as my peculiar invention is the form and arrangement of the bars of the beaters; and the mode in which they are placed and secured on the square block of wood by dovetailing, or locking; and the form of the revolving beater, or square block of beaters."

Like many others, the present patentee appears to have paid the fee, for the privilege of marking "PATENT" upon his machine, which may induce the unwary to suppose that it must be both new and good; the latter it may be, the former admits of doubt.

17. For machinery for *Blowing Wind for the use of Forges, Furnaces*, &c.; Daniel Strobel, jr. city of New York, May 9.
(See specification.)

---

18. For *Concentrating Sirop, or Cane Juice*, &c. by steam; Daniel Strobel, jr. city of New York, May 9.
(See specification.)

---

19. For a Composition for the *making of Beer;* Stephen Hinds, Montrose, Susquehanna county, Pennsylvania, May 11.
(See specification.)

---

20. For a *Mill for Grinding Grain;* John P. Phillips, Doe Run, Chester county, Pennsylvania, and John Holliday, Wilmington, Newcastle county, Delaware, May 12.

In this mill, which is of the small, or portable kind, there are three stones standing horizontally, the middle of the three being the runner, whilst the lower and upper stones are at rest. The patentees say:

"What we claim as our invention is the arrangement of the different parts of the before described mill; the use of a middle stone turning horizontally, faced on both sides, by which different kinds of grain can be ground at the same time, yet keeping the meal separate. Also the manner of hanging the upper stone; the mode of conveying the grain to be ground to the two faces of the middle stone; and the mode of tempering the stones, particularly the upper stone. We do not claim the invention of having three stones, but merely the arrangement of them as above described."

---

21. For Machinery for *lifting Ships out of Water*, for inspection and repair; Thomas Evans, machinist, and John Parsons, ship carpenter, city of New York, May 13.

This apparatus is intended to lift ships vertically out of the water, in the manner of the screw docks; but the power applied is that of the hydrostatic press. Its mode of application, however, differs essentially from that of Thos. Evans, described at p. 160, vol. 6.

Two cylinders, furnished with pistons, are placed horizontally, one at each side of the dock, at the land end. A steam engine is employed to force water into the cylinders, to depress the pistons. To the piston rods, timbers, forming a sliding frame, are attached, which extend along the sides of the dock, and from these timbers chains pass over pullies, and act upon other timbers crossing the dock, and over which the vessel is to be floated, as in the screw docks. There is an ingenious but simple contrivance for letting the vessel down, after her repairs have been completed; this we shall not at present attempt to describe, as it is our design hereafter to give an abstract of the specification, accompanied by engravings.

From some remarks in the specification, it would appear that the operation of this apparatus has been tested; we, however, are not informed to what extent. The principal objection which presents itself

to us, from examining the plan upon paper only, is, that it will be difficult, if not impossible, to give to it the strength of the screw dock, so as by its aid to raise vessels of a large class.*

Specifications of American Patents.

Specification of a patent for an improvement in the process of Dressing Woollen Cloths, and Cloths composed partly of Wool and partly of Cotton. Granted to Calvin W. Cook, *Lowell, Middlesex county, Massachusetts, April* 23, 1831.

The description of this process is as follows: Take broad cloths, sattinetts, or any like cloths to be subjected to the process, after they have been fulled and rinsed clean, but before the pile or nap has been raised upon them, and wind them upon wooden rollers, or cylinders, as tight as can be done without tearing the cloth. Confine them with a twine tied around so that the cloth cannot unwind, and so that the whole may remain firm and tight upon the roller, or cylinder; then prepare a kettle, or cauldron, of sufficient dimensions to receive the roller, or cylinder, with the cloth upon it. Fill the kettle, or cauldron, after having put the roller, or cylinder, with the cloth upon it, therein, with water, and apply heat thereto, until the heat rises from one hundred and eighty to two hundred degrees of Fahrenheit's thermometer, for all cloths excepting whites and blues; and for the last mentioned colours the heat may be raised to two hundred and twelve degrees, or to boiling heat. The other colours will not endure so great a degree of heat; the degree of heat can best be decided upon by experience from time to time, owing to the various ways of producing the different colours, in the different parts of the country. The degree of heat above mentioned, it is believed, will in general best answer the purpose without injury to the cloth. The water should be kept at the degrees of heat above mentioned, for the space of six hours; after which the cloth should be taken from the water and suffered to cool upon the roller, or cylinder, which will usually take about twenty-four hours.

Instead of water, steam may be applied at the same temperatures, for the same length of time, and will answer the same purpose; but in this case the cloth must be wound around a revolving roller, or cylinder, which must be kept continually in motion during the process, and the steam must be confined by a wooden box, made very tight, so as to include the rollers, or cylinders, with the cloth upon them, within it. The cloth is to be taken out and cooled in the same way as when heated by water. The operations above mentioned render the cloth very firm in the bottom, divest it of wrinkles and cockles, or drawn places, and render it even and smooth on the sur-

* Some weeks will probably elapse between the date of this patent and that which will be next issued, as, in consequence of the absence of the Attorney General, the signature of that officer cannot be obtained, and without this a patent would not be valid.

face, so that the teazles, or points, may act uniformly upon the cloth, and the fibre of the wool, or cloth, is thus rendered more pliable, and is more easily turned and laid straight and smooth in the process of teasing, or raising the pile, or nap, thereon. And I, the said Cook, do hereby expressly declare, that all that I claim as new, and of my invention, or discovery, is the subjecting the cloth to the process aforesaid, in the manner aforesaid, and for the purposes aforesaid, after the same has been fulled, and before the pile, or nap, has been raised thereon by the process of teasing.

CALVIN W. COOK.

Specification of a patent for a Screw or Spiral Lever, for the propelling of Vessels, for a new mode of Navigation. Granted to JOHN JAMES GIRAUD, *M. D., city of Baltimore, Maryland, April* 27, 1831.

INSIDE of a paddle water wheel, or frame, having a round hole in the centre, I place upon two sides, a screw, or spiral lever, three-fourths, more or less, the diameter of the said paddle wheel; this screw, or lever, to be two or more turns of the spiral: this screw lever will be attached to two self acting fulcrum levers in the following manner.

The ends of the levers, where are placed the fulcrum, are fixed, the one opposite to the other by their fulcrum, upon the edge inside of the paddle wheel, the one below, the other above, and distant a few inches from a straight line; the two other ends of the lever are fixed to a square piece of a few inches, with a round hole in the centre, placed in the middle of the paddle wheel; the end of the centre of the screw or spiral lever, is fixed on the side of the end of the lever, which is fixed on the side of the square piece, and the other end, which is made the end of the screw or spiral lever, is fixed upon the other lever, and near the fulcrum.

I place upon the screw or spiral lever, a solid round wheel, twice the diameter of the paddle wheel, with a round hole in the centre, and fixed in the middle upon the square piece above mentioned. This solid wheel has two bars, one opposite the other, which project from its edges, coming level with the edge of the paddle wheel, one below, the other above, without touching it, a little distant from a direct line; place upon the ends of the bars a self acting fulcrum lever, by their fulcrum; the other ends of the lever to pass a little over the hole in the centre of the solid wheel:—a square piece of a few inches, having a square hole in the centre, will be placed between the two ends of the levers, to touch, yet leaving it free. A smaller screw or spiral lever will be placed and fixed to the ends upon the side of the end of the lever, which touches the square piece; and the other end of the screw to be fixed upon the other lever near to the edge of the solid wheel; the same thing to be done upon the other side of the paddle wheel. The shaft of the paddle wheel is square

in the middle, and round at each end: the shaft is placed in the holes of the two square pieces, and the power is conveyed there.

I claim the principle of my invention and improvement in every species of levers, and of every form, and figure, and application, as above described. J. J. GIRAUD.

Dr. John James Giraud's Self-acting Fulcrum Screw or Spiral Lever, for propelling Vessels and Rail-road Carts, &c. &c.

Fig. 1.

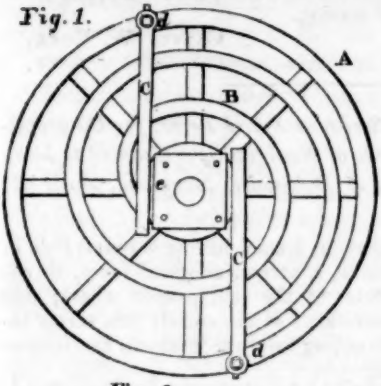


Fig. 2.

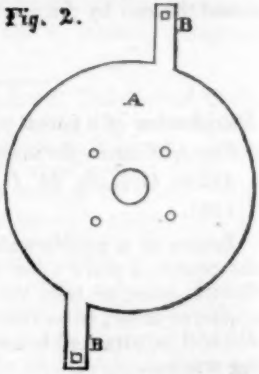


Fig. 3.

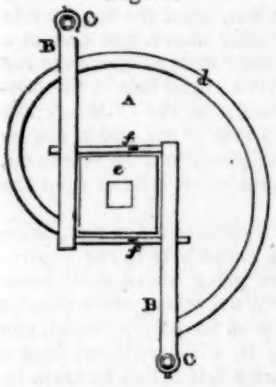


Fig. 1.—A. The inside of one side, or part of the water paddle wheel.

B. Screw, or spiral lever.

c, c. Self-acting fulcrum levers.

d, d. The fulcrum.

e. The square piece with round holes.

Fig. 2.—A. Solid wheel with round hole in the centre.

B, B. Projecting bars with square holes.

Fig. 3.—B, B. Self-acting fulcrum levers.

c, c. The fulcrums.

d. The screw, or spiral lever.

e. The square piece with square hole.

f, f. The moving bars.

☞ Fig. 2 is to be placed upon Fig. 1, and Fig. 3 upon Fig. 2.

Remarks by the Editor.—We have noticed several patents obtained by Dr. Giraud, and have attempted an analysis of them in our monthly list; from the recondite nature of his discoveries we have always risen from our task with a conviction that the attempt has been a failure; and such would have been the case in the present instance. To save ourselves from this mortification, we have deter-

mined to publish the specification entire, with the drawings intended to illustrate it.

"A new mode of navigation," if it be an improved one, is an invention of no mean importance, and should any of our scientific readers be more fortunate than we are, in keeping up with the patentee in the elucidation of his mode of "propelling vessels, and railroad carts," &c. &c., we ask of them to supply us with a commentary upon the subject.

Since the foregoing was written, we have seen, in the Baltimore papers, an attempt to explain the operation, and to convince the public of the great value of this machinery. The style of the explanation accords so well with that of the specification, as to fix upon them the character of a common origin. So far as we are concerned, however, the explanation has not served to explain, what the specification failed to specify. They are both transcendental.

Specification of a patent for a Machine for Grinding, Levelling, and Polishing Metallic Plates, to prepare them for the Engraver, and for other purposes. Granted to J. W. STONE, *Washington city, D. C. April* 30, 1831.

To all whom it may concern, be it known that I, J. W. Stone, have invented a new and useful machine for the purpose of grinding, levelling, and polishing plates of copper, steel, iron, brass, or other metals, so as to prepare the same for the use of the engraver, or for other purposes, and to grind, polish, and level metallic or other hard substances, such as marbles, stones, slates, or any substance that require to be ground and polished, and that the following is a full and exact description of the manner in which I effect the same.

When metallic plates are to be ground, levelled, or polished, they are first hammered, or planished, in the usual manner, or made flat in any other way; they are then placed on a flat horizontal bed, which may be made of any suitable material, and sufficiently large to secure the largest piece to which the machine is adapted; the plates are secured to the bed by ledges, stops, or in any other convenient manner. The bed upon which the plate is fixed, is carried backwards and forwards, under the stones, grinders, buffs, or brushes, by which the plate is to be ground, levelled, or polished. The diameter as well as the width of these stones, buffs, polishers, or brushes, may vary according to the power applied to the machine, or the nature of the article operated upon. To give the traversing motion to the bed, a part of the general frame work of the machine forms a rail or carriage way of double the length of the bed. An iron screw, or rack, is placed under the bottom of the bed, and lengthwise of the machine; this iron screw, or rack, is operated upon by means of gearing from the crank or part to which the power used is applied, and for the purpose of giving motion to the other parts of the machinery. When a screw is made use of to move the bed on the carriage, a thread is cut through the centre of a wheel, which wheel is attached to the rail or carriage way on which the bed slides. This wheel is held firmly

on its own axis, thereby preventing its moving in a line with the screw, whilst at the same time it turns freely, and when motion is given to it, the screw is forced along, either backwards or forwards, to the distance required. I intend sometimes to attach a toothed wheel to the head of the screw, in order to cause it to revolve; the screw, in this case, will be made to work in a fixed nut, when the same effect will be produced as in the former arrangement. When, instead of the screw, a rack is used, it is fixed to the bed, and a pinion is made to operate on it in the usual way. The shaft to which the power is first applied may be made to revolve in one direction only, and yet carry the bed and plate backwards and forwards, by the addition of gearing, made to engage and disengage, in a way well known to machinists. This gearing, however, may be conveniently dispensed with, especially when the machine is worked by hand, as the crank may be turned either way. The grinding, levelling, or polishing, is effected by revolving stones, grinders, buffs, or brushes; these are fixed on proper spindles with whirls on them to receive a band from the main shaft. The spindle is fixed in a frame in such a way that the grinders or buffs may operate upon the plate. This frame extends back to one end of the machine, where it works upon a pivot, or bolt, which allows it to receive a lateral vibratory motion; such a motion being essential to the proper action of the grinders, buffs, &c. This motion may be effected by placing two eccentric wheels reversed on the shaft to which the power is first applied; one operating on each end of the frame that receives the grinders, buffs, &c. thereby causing the frame to move on the bolt, and consequently give a lateral vibratory motion to the grinders, buffs, stones, polishers, or brushes; or this motion may be effected in various other ways.

The bed that carries the material to be ground, levelled, or polished, and the buffs, polishers, brushes, or stones, as well as the parts which give the vibratory motion, are geared and connected in such a way as to move at one uniform and fixed velocity, otherwise the surface to be ground or polished would be acted upon unequally.

The frame carrying the grinder, &c. I force down by a spring, or weight, or otherwise, according to the force with which I wish them to bear on the material to be ground, making an arrangement to increase or remove the same at pleasure. The lateral vibratory motion of the grinder, polisher, &c. may be increased or decreased in such a manner as may best suit the size or nature of the material to be ground or polished.

The grinders may be made either of wood, iron, steel, copper, lead, stone, or other material, and their action promoted by applying any gritty substance pulverized, either dry or with oil, or water, as the case may require. The grinder, to operate well, should be of a softer material than the article to be ground or polished.

What I claim as my invention is the grinding, levelling, or polishing plates of copper, or other metals, or slabs of marble, stone, slate, glass, or any other material, by placing them upon a traversing bed, and operating upon them by means of revolving stones, grinders, buffs, and brushes, which revolving stones, &c. are fixed in a

frame to which a lateral vibratory motion is given; this lateral vibratory motion forming an essential part of my invention.

J. W. STONE.

Specification of a patent for an Apparatus to be connected with, and to form part of, a Steam Engine Boiler. Granted to PHILO C. CURTIS, *Utica, Ontario county, New York, May* 3, 1831.

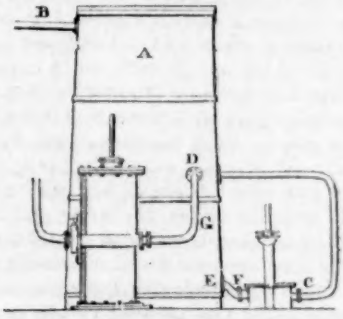
MAKE a tub of about four feet in height, and two feet and four inches in diameter at the top, and two feet eight inches at the bottom. This is a suitable size for a high pressure ten horse power engine. This tub should have two heads, one at each end, and a partition about eighteen inches from the bottom of the tub. In the drawing annexed, the vessel marked A, exhibits the form of the tub. Within the tub, and between the upper end thereof and the said partition, place a strong tube with a calibre of about one and a fourth inches in diameter, and about sixty feet long, coiled similar to a common condensing worm for a distillery. One end of the tube passes through the upper part of the tub, and is firmly connected with the boiler; this part of the tube is marked B. The other end passes through the lower part of the tub above said partition, and is firmly connected with the forcing pump of the engine, as at the letter C on the drawing. The upper part of the tub should be tight, except an inlet, C, for the steam from the piston cylinder; and an outlet for the said steam through a tube firmly connected with the said partition, and from thence extending downwards towards the bottom of said tub; and through which tube the steam is conducted into the lower part of said tub, and below the surface of the water therein; as said lower part should be kept about half full of water. This water may be supplied either from a fountain, or by the operation of the engine, to serve for feeding water for the boiler. A tube of the calibre of the one first above mentioned, should be placed between the tub and the forcing pump, one end of which said tube should be firmly connected with a hole in the side of said tub, and near to the lower end thereof, so as to receive the water from the said lower part of the said tub; and the other end of said tube should be firmly connected with the forcing pump. Letter E on the drawing shows the point of connexion between the tube and the tub; and letter F shows the point of connexion between said tube and the forcing pump. When the engine is in operation, the forcing pump draws water from the lower part of the tub into the tube at E, thence it passes through the pump into a tube at C; thence through that tube as it is continued and coiled, through the upper part of said tub, and so on until it is discharged into the boiler through B. The steam from the piston cylinder is conducted from it through a tube and discharged into the upper part of the tub at the letter D; the steam so discharged fills the said upper part, and heats the water as it passes from the forcing pump through the tube into the boiler, as before described. From this upper part of the tub the steam passes into the lower part of

said tub, through the tube of which mention has been before made; and from this part of the tub that part of the steam which remains uncondensed, passes off through another tube; which tube should be connected with the tub below the partition, and above the water in said lower part.

The objects to be effected by the improvement and apparatus above described are, 1st. A reduction in the consumption of fuel for the boiler. This is done by giving to the water which is conveyed into said boiler, a very high temperature, on its passage through the coiled tube in the upper part of the tub. 2nd. This mode of supplying heat for the water in the boiler, is more regular than it could be if furnished by fuel alone; hence less attention to the furnace is required, and the generation and supply of steam from the boiler are more regular than in the ordinary mode. The object of the coiled tube is to form a surface of sufficient size, which being exposed to the steam in the upper part of the tub, will allow the water in passing through said tube, time to acquire, very nearly, the temperature of the steam in the tub, and which, as the water is confined in the tube so that it cannot change into steam, is practicable. The water is thus raised in temperature much above boiling heat, and in that state passes into the boiler. The above described form I think the best calculated to produce the desired effects. The size of the apparatus must be varied in proportion to the capacity of the engine.

The combination of the above apparatus, and the application thereof to effect the objects above specified, are what I claim to have discovered and invented. PHILO C. CURTIS.

Curtis' Steam Apparatus.



Specification of a patent for an improvement in Medicine. Granted to JOSEPH BAKER, *Jefferson, Ross county, Ohio, May 5,* 1831.

A MODE of *prepareing*, mixing, compounding, *administering* and *useing* the medicine herein described in the *maner*, and in the diseases hereinafter mentioned: that is the mode of *prepareing* and compounding medicine for an emetic and *al so* to *cous* a free *per spiration*

to be administered in diseases *coused* by cold and *ob structed* perspiration, such as *fevurs rumatism, dysentery* dropsy *consumtion pleuricys* Boldhives and all stagnated complaints with some others

N. B. All *Root* and Barks and Herbs must be first dried pounded in a *morter* or ground in a mill before *thay* are made *in to* medicine

Part the first.—Take *Sinaca* snake root one ounce Take Liver wort tops three quarters of an ounce Take *plantin* roots and tops one quarter of an ounce mix these well *to gether* this *formes* the first part of the *compasition*

Part the Second.—Take the Bark of the root of *sasafras* a half ounce—Take the *in side* Bark of wild *Chery* a half ounce.—Take the *in side* Bark of Elder a half ounce—Take *Sulfer* or *Brim stone pulferised* a half ounce mix these well *togethur*—this *formes the se cond* part of the *compasition*

3d part.—Take *Lobela* or what may be known by the name of indian *tobaco* the tops gathered in september two ounces

This *formes* the third part of the *compasition* which is to be administered *all togethur* or in parts as the nature of the case may require—It should Be remembered that *Equel* portions of these three parts *formes* the whole *compsition* of medicine,—It should be remembered that a dose of *Ither* of these powders for an ordinary *constatution* is on average tea spoon full and *a lowance* should be made for the *different constituons* of people

When the violence the *diseas requiers* a *speady remady* and Nature calls for an emetic and there is an *ob structed* perspiration it is *nesasary* in this case to give a dose of powders of the whole *compasition* and wash them down with a half a *point* of cold weak lie made of the bark of shell bark *hickary*, and if this dose do not operate as an emetic in 15 Minutes give a second dose with a less *quantaty* of lie or *jist a nough* to wash it down and if it doth not operate in the same time you may try the third and *fouarth* on the same rule which will *scarly* fail this process commonly produces a free perspiration then continue the process by *giveing* a dose of powders of the first part of the *compasition* and in thirty minutes sweat until you get a free sweat over the body the way to sweat is to cover the person all over and make *youse* of two over lids one at a time have their feet in warm water and *sit* your over lid under the cover and form a mixture of one third *whisky* and two thirds water of *a bout* three gills and steam it on the over lid as *thay* can bear it and repeatedly *sup* warm tea and when done put them to bed cover *thir* breath a short time with a hot stone *squinched* and *wraped* up in a wet cloth at *thir* feet *thir* teas should be spice bush or red *peper* during sickness make a drink of water by *squinching* a hot *cole* in it *tell* the chill is *of*

Take two doses of the *fiers* part of the *compasition* in the course of 24 hours and one of the second part *divideing* the time of *takeing* them—and sweat once a day for three days and if the person have fever and ague *sweet* once a day *untill* it *leaves* them and keep up a moist sweat as steady as *posable* during the whole time and keep them warm in the chill and fever—*there* diet should be light such as chicken or squirrel broths with a little of the meat and as little bread as *posable thay* can make *youse* of rice or *homany* But keep the *stomack*

as empty as *conveenyant* and *espesually* for three days and *aftur* that *thay* can *in creas thir* diet *gradualy untiel* well

If the *diseas* is less violent you may leave out the first part of this process and begin by *giveing* a dose of the first part of the *compasition* and then sweat and so follow the rule as is laid down *a bove* and if it is found that the first part of this process is *ne sa sary* it can be *aplyed* at any other time

In *pluracys* and bold hives and many other complaints it is only *nesasary* to *persue* the rule *untill* the *patiant* recovers which is not likely to be long

Let it be well remembered that nature is the Grand *Phesition* and *wee* are only to assist her in *removeing* the *ob structtions* that *is* found in her way as far as is in our power and that *whe* should pay *petickler atention* to her *clames* and try to supply her wants if *posable*

In cases of less violence these powders may be taken without a preparatory sweat either in whole or in separate parts as the cases may require JOSEPH BAKER.

Remarks by the Editor.—It has been with some difficulty that we have done justice to the new orthography employed in making known the foregoing new and improved mode of curing diseases; as, however, it would have been the height of injustice to its author to have added, or abstracted, a jot or tittle from his elegant memoir, we have cheerfully undertaken the labour of following him through all his labyrinths. We are truly glad that we are not called upon to write a commentary upon the system, and still more so that we are not compelled to have its efficacy tested by becoming the *patiant* of this great *Phesition.*

Abstract of the specification of a patent for a method of Generating Gas, and of supplying and continuing Gas Light, out of oil, or other suitable substance, by means of the gas light itself, in lamps, or machines, either fixed or moveable. Granted to SOLOMON ANDREWS, *M. D. city of Perth Amboy, Middlesex county, New Jersey, April* 15, 1831.

THIS invention consists in having the gas lamp so constructed that the heat of the inflamed gas, or gas light itself, operating upon the oil or other substance used for the purpose, shall continue to form gas therefrom to supply or feed the gas light. In the accompanying drawing the letters *a*, *a*, represent a part of the supply tube through which the oil or other material enters, of which the gas is made; *b*, the upper end of the supply tube emptying into the bulb; *c*, the bulb, represented in the form of an inverted cone, which may be filled with fine wire, to communicate heat the more readily throughout the contained fluid, the gas being generated in this bulb: *d*, a turret erected to cover the gas tube, *e*, which is best elongated so as to extend above the bulb, to prevent any particles of oil or other substance from entering the gas tube. *f*, the entrance into the gas

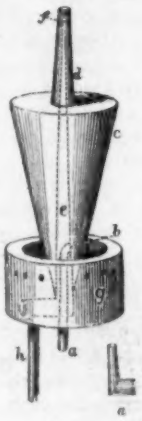
tube, which descends down through the bulb into the gas recipient, *g*, through the holes or orifices of which the gas which is to be inflamed issues. The dots around the recipient represent these orifices, and *h* a waste tube to carry off any surplus oil.

The oil to be decomposed enters at the orifice of the supply tube, passes up that tube into the bulb, where it is converted into gas by the heat of the flame surrounding it. The gas rises to the top of the bulb, and turret, and passes down the gas tube into the recipient, whence it issues through the openings at which it is to be lighted. The surplus tube serves to conduct off any particles of fluid which may come down with the gas, and thus prevents obstruction.

In order to light the lamp, oil must be admitted into the bulb; this part may then be heated by a common candle or lamp, but it will be much facilitated by using a small blow pipe. When a small portion of gas issues through the openings in the recipient, it will inflame, and the generation and combustion be continued.

To preserve the oil at a proper height in the bulb, allowing a sufficient supply without endangering its raising too high, and flowing into the gas tube, several devices may be adopted, as by the common fountain lamp, or by using a stop cock, and adjusting it so that no more than the proper quantity shall enter.

S. Andrews' Gas Generator.



Silver, as being the best conductor of heat, and resisting oxidation, is esteemed the most suitable metal for making the apparatus.

"My new invention consists in generating and forming out of the oil, or other substance used for the purpose, the gas which continues and supplies the flame of the gas light, by the application of the heat of the inflamed gas itself to the oil or other substance used, so as to cause a continued gas light, and without the intervention or use of wick, to burn in contact with the flame, and in so constructing and forming the gas lamp, or machine, as to produce that effect."

SOLOMON ANDREWS.

Abstract of the Specification of a patent for a mode of commencing the generation of Gas in the Lamp described in the preceding specification, by means of a spirit lamp, filled with alcohol or other highly inflammable fluid. Granted to SOLOMON ANDREWS, *M. D. city of Perth Amboy, Middlesex county, New Jersey, May* 5, 1831.

IN lighting the lamp described in the foregoing specification it is stated that after oil has been admitted to the bulb, that part may be

heated by a common candle, or rather by the aid of a small blow pipe, in order to commence the decomposition of the oil, and its consequent conversion into gas. The present invention is intended to obviate the difficulties attendant upon these modes of commencing the combustion.

To effect this, the supply tube *a*, represented in the cut in the last article, is to be surrounded by a small cup, about the diameter of the recipient *g*. This cup is to be supplied with a small portion of alcohol, or other inflammable fluid which will burn without a wick; when this fluid is lighted, the flame produced by it will heat the bulb *c*, and convert a portion of the oil contained in it into gas. To supply this cup it is proposed to have a small reservoir, somewhat similar to that for oil; a tube from this reservoir, is to lead into the cup, a small stop cock allowing a portion to flow in when wanted.

"My newly invented improvement, which is the subject of this patent, consists in generating gas in the first instance of my new invented gas lamp or machine, and so as to put the new invented gas lamp, or machine, into operation, by means of the flame of the said alcohol, or other fluid, rising up and surrounding the bulb of the said gas lamp, or machine. And in so constructing and applying the spirit lamp, or machine, as to produce that effect."

Remarks by the Editor.—At page 32, of vol. I, (for Jan. 1828,) will be found a cut and description of a "self generating gas lamp," taken from the Edinburgh Philosophical Journal. Its principle of action resembles the foregoing, although the parts are differently arranged. In the Edinburgh lamp it is proposed to cause the generation of the gas to commence by the application of a small iron heater prepared for the purpose. Whatever ingenuity may be displayed, however satisfactory the operation of an instrument may prove, and how great soever may be the interest excited on its first introduction, if it is intended for ordinary use in domestic economy, there must be no greater trouble in putting it into operation than has attended the apparatus for which it is to be a substitute, or its chance of continued favour will be very small. The original "self-generating gas lamp," we apprehend, failed from this cause, and we are fearful that the one before us will be unable to surmount the opposition of chamber maids, cooks, and scullions.

Besides this difficulty, will there not be a rapid accumulation of carbonaceous matter in the reservoir, from the mucilage always contained in oil? There is no provision made for cleaning it out, nor does it appear easy to remove this objection.

We have seen the lamp in operation; the flame was clear, but somewhat flickering, a defect which probably was accidental. The oil did not appear to be perfectly converted into gas until it issued from the recipient into the flame; for, if extinguished at some of the orifices, it escaped from these in the form of a dense vapour, which the flame would have decomposed and converted into gas.

Specification of a patent for an improvement in Machinery for Blowing Wind, for the use of Forges and Furnaces. Granted to DANIEL STROBEL, JR., *Civil Engineer, then of the city of Washington, but now of the city of New York, May* 9, 1831.

To all whom it may concern, be it known, that I, Daniel Strobel, Jr., have invented an improvement in the machinery for blowing wind, for the use of forges and furnaces, and that the following is a full and exact description thereof.

The principle which I have adopted has been already applied to the raising of water in pumps, in which the part operating as a piston has been made to work without friction against the sides of the chamber; but the form of the chamber which I have adopted, the general arrangement of the apparatus, and the application of it to the purpose of blowing, constitute my invention.

The accompanying drawing shows a longitudinal section of a double acting blowing machine on the before mentioned principle, (in this case supposed to be worked by the lever beam of a steam engine,) in which A and B represent two conical vessels joined together by flanches and screw bolts at their larger ends, and having their small ends joined to two square valve boxes, C and D. E represents a leather diaphragm, capable of assuming the conical form of one of the vessels; the edge of this leather is securely fastened to the conical vessel, (formed by the two vessels A and B,) by being bolted between the two flanches *a a*, *b b*, of the vessels A and B. The middle of the diaphragm is firmly secured to a metal or wooden disk, F, by being bolted or rivetted between the two plates, *c* and *d*, of which the disk, F, is composed. G, is a polished cylindrical metal rod securely fastened by one end to the centre of the disk, F, the other end communicating with the moving power. H, is a stuffing box containing two cupped leathers through which the rod, G, works:—the cupped leathers, stuffing box, and its gland, are too well known to need any description. *e*, *f*, *g*, *h*, are four hanging valves, *e* and *f* communicating with the atmosphere, and *g* and *h* with two passages, I and K, leading from the valve boxes, C and D, to the air vessel or regulator. The regulator is constructed on the same principle as the blower, being composed of two conical vessels, L and M, connected together by their larger ends in the same manner as the vessels A and B. The smaller end of the vessel L, is joined to the horizontal passage K, whilst the smaller end of M is open to the atmosphere. The vessels L and M contain also a leather diaphragm, N, similar to E, which diaphragm, N, is connected to the vessels L and M in the same way as E is connected to A and B. To the middle of the diaphragm N, is affixed a disk, O, in the centre of which is fastened a metal or other rod, P, which passes through a guide, Q, adapted to the vessel M. The upper end of the rod, P, carries a weight, R, which must be proportioned to the density of the blast desired. To the horizontal passage, K, is fixed the pipe, S, conveying the blast where it is required. The operation of this machine is as follows—motion being communicated to the rod G, (which is supposed to be

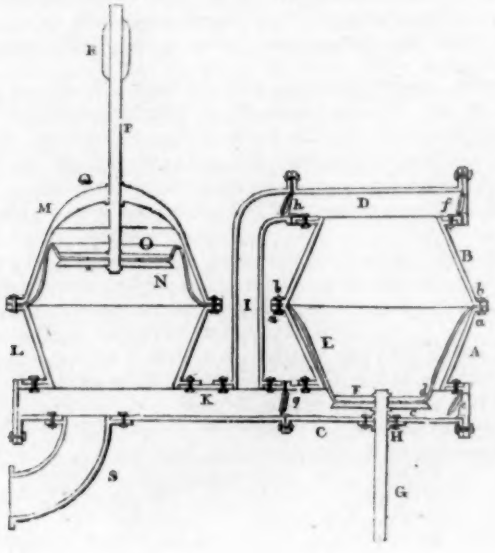
just ascending,) a partial vacuum will be formed in that part of the blower situated below the diaphragm E, at the same time the valve *e* will open, and the atmospheric air will rush through it to restore the equilibrium, whilst the air, situated above the diaphragm E, will become compressed until its elasticity becomes sufficient to force open the valve, *h*, leading to the regulator. As soon as the rod, G, begins to descend, the valves *e* and *h* will close, and *f* and *g* will open; *f* admitting air above the diaphragm, and *g* permitting that below to escape into the regulator. The regulator keeps up the continuity of the blast, which would otherwise be interrupted at the change of stroke, by an enlargement or a diminution of its capacity, in a manner which will be readily understood from the annexed drawing.

In constructing this apparatus I do not intend to confine myself to the particular arrangement which I have exhibited, or to the precise form given to the wind chambers. The latter may be barrel shaped, or otherwise enlarged towards their middle, for the purpose of allowing free play to the leather diaphragm, this being the object of the enlargement. The machine also may be made single, instead of double, with the regulator placed immediately over the blower.

What I claim as my invention, and for which I ask a patent, is the application of a vessel, such as I have described, with its diaphragm and disk, to create a blast both in the ascending and descending strokes, upon the principle herein set forth. And the employment of a regulator, acting in the manner, and for the purposes which I have fully explained in the foregoing specification.

DANIEL STROBEL, JR.

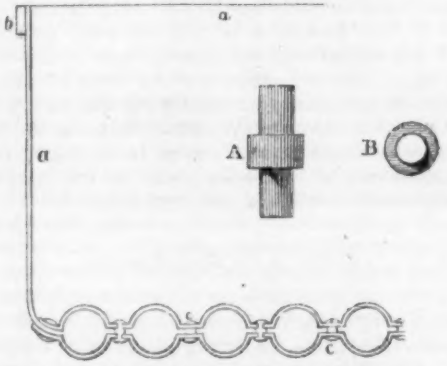
Strobel's Blowing Machine.



Specification of a patent for an improved mode of applying the heat from steam to the purpose of concentrating Sirop, or Cane Juice, &c. Granted to DANIEL STROBEL, *jr. then of the city of Washington, but now of the city of New York, May* 9, 1831.

To all whom it may concern, be it known, that I, Daniel Strobel, jr. have invented an improved mode of applying the heat from steam to the purpose of concentrating sirop, or cane juice, and other articles in which this process is required; which invention is also applicable in the process of distillation, and that the following is a full and exact description of the same; reference being had to the drawings which accompany this specification.

Strobel's Evaporating Pan.



The still, or evaporating pan, may be made in any of the usual forms, and of any suitable metal, my improvement consisting in the manner in which the bottom is constructed. The accompanying cut represents a part of an evaporating pan, cut through by a vertical plane passing through it, perpendicularly to its length. *a*, shows the sides of the pan. *b*, an iron band passing round it, and secured by rivetting, or otherwise. *c*, *c*, shows the manner of making the bottom, which is double, being formed of two or more plates of metal, between which the steam is to pass. Each plate is indented, fluted, or grooved, in the manner represented in the drawing; each groove forming one-half of a cylindrical, or other formed, cavity. The two plates are then to be tied together by means of rivets; not, however, in such a way as to cut off the communication between them, but allowing a free passage of steam from one to the other. For this purpose I intend generally to make the rivets with a double shank, as shown enlarged at A, the projection between the shanks, serving to separate the plates. The same end may be attained by washers, or by strips of metal crossing the flutes. B shows a horizontal projection of the double shank rivet.

The double plates, forming the cavities herein described, instead of forming the bottom of the evaporating pan, may be placed within any of the pans now in use, parallel to, and elevated a little above the bottoms of them, thus exposing the sirop, or liquid, to the action of both sides of the heated metals.

I do not particularize any mode or manner of introducing the steam, as this is familiar to every machinist, or engineer; nor is it necessary to describe the modifications which will be required when the double plates are elevated above the true bottom of the pan, as these also are sufficiently obvious without such description.

What I claim as my invention in the apparatus hereinbefore described, is the indenting, fluting, or grooving of plates of metal, and tying or uniting the same together for the purpose, and upon the principle which I have set forth. DANIEL STROBEL, Jr.

Specification of a patent for a Composition for the making of Beer. Granted to STEPHEN HINDS, *Montrose, Susquehanna county, Pennsylvania, May* 11, 1831.

To all to whom these presents shall come, be it known, that I, Stephen Hinds, of Montrose, in the county of Susquehanna, and state of Pennsylvania, have invented a new and useful composition for the making of beer, and that the following is a full and exact description of the composition and process of compounding the same as invented by me, to wit: one pint of molasses, one pint of new milk, and one pint of common hop yest, are put into a six gallon keg, which is then filled with air, by means of a pump, or in any other mode most convenient, until no more can be compressed into the cask; it is then corked up, and let remain in that state for twenty-four hours. At the expiration of that time, two gallons of water are mixed with one quart of molasses, one ounce of ginger, half an ounce of allspice, and half an ounce of the essence of spruce, heated boiling hot, and put into the cask, with three and a half gallons of cold water, again corked up, and permitted to remain twenty-four hours longer. The beer will then be fit for use. When the beer is drawn out, except two quarts of the sediment, which should be left in the cask, the last described composition can be again added to it, and so on during the season.

What I claim as new and as my own invention in the above described manufacture and composition, and for the use of which I ask an exclusive privilege, is the composition first above described, the proportions of the second described composition, and the whole process of making.

The whole of the beer should be drawn without a vent. The carbonic gas generated in the beer, renders one unnecessary.

STEPHEN HINDS.

Specification of a patent for an improved Machine for Cutting Grass and Grain. Granted to WILLIAM MANNING, *Plainfield, Essex county, May* 3, 1831.

I PROVIDE an axle tree with two wheels, of the common construction. To this axle tree I attach shafts, by which a horse is to draw the machine. From the axle tree extend two arms in the direction of the shafts; these arms are morticed into, or otherwise attached to the axle tree; they are of greater length than the shafts, extending beyond them a sufficient distance for the cutting apparatus to be entirely clear of the horse. The two arms are united together by a cross bar at their extreme ends; which cross bar, when the machine is in action, rests, and slides forward on the ground; teeth of six or eight inches in length, more or less, are set like rake teeth, standing forward on the cross bars. These are made slender, and are for the purpose of holding the grass or grain to be cut.

The cutters stand immediately above the teeth; and receive a traversing motion in a way to be presently described.

A flat bar of iron lies along upon the cross bar, and the cutters are to be attached to this upper bar. The cutters are spear shaped, and are sharpened on each of their edges. They may vary in their length and width, but ordinarily they may be about six inches long, and three or four wide at their bases. The grass or grain which is held up by the teeth, passes between these knives, or cutters. To give a traversing motion to them, a lever may extend from the inner end of the hub of one or both of the wheels, to the cutter bar; this lever may work upon a pin at or near its centre; a zigzag groove in the hub, or in a wheel attached to it, will give it a vibratory motion, and its connexion with the cutter bar at the opposite end, will cause that to traverse.

I intend sometimes to make the cutters revolve instead of traversing. They are then to be fixed upon the periphery of a wheel; the teeth being placed on a fixed semicircle. The cutters will then have one sharp edge only. The wheel may be made to revolve by bands, or gearing, from one of the main wheels, in various ways.

When the machine is small, it may be moved by the power of a man. The shafts may be fixed forward of the cutters, and the general arrangement be varied, without altering the main principle of my machine.

What I claim as my invention, and for which I ask letters patent, is the combined action of the teeth and cutters, whether the cutters are moved in a traversing or a revolving direction.

WILLIAM MANNING.

ENGLISH PATENTS.

To THOMAS BOTFIELD, *coal and iron master, for his invention of certain improvements in making iron, or in the method, or methods, of smelting and making of iron. Sealed 2nd January*, 1828.

Two leading features are proposed by the patentee as novel in connexion with the smelting of ore, which are the adaptation of a high chimney to promote a draft of air in a blast or cupola furnace, and the employment of salt or other substance containing soda in the process of smelting the ore.

The particular form of construction of the apparatus does not appear to be important, it is simply proposed to erect a high chimney contiguous to the cupola, with channels, or flues, leading from the lower part of the furnace, opposite to the tuyere hole, where the blast of air enters, and also from the upper part of the cupola into the high chimney, by means of which a very considerable draft will be produced through the tuyere hole, and the ore become more effectually operated upon by the consequent increased heat of the furnace, than in the ordinary construction of blast furnaces.

As it is considered that the employment of heated air would improve the blast, and be beneficial to the metal produced, a small furnace or heating stove is placed contiguous to the tuyere hole, and a current of air passed through it, which air, after it has become heated, is brought into the blast at the tuyere hole, and is carried through the furnace by the draft of the chimney.

The employment of salt, or other material, containing soda, is confined by the patentee to the operation of smelting the ore. The same was used by Mr. Duckock, for manufacturing iron in the puddling furnace. [*Lond. Jour. of Arts and Sciences.*

To JAMES SMETHURST, *lamp manufacturer, for an improvement, or improvements, in lamps, communicated to him by a foreigner residing out of the British dominions. Sealed 6th November*, 1827.

THIS invention is a lamp for the table, on the hydraulic, or fountain principle, in which the oil is made to rise up a column to the burner, by the pressure of a descending column of some heavier fluid. The oil is placed in a receptacle near the bottom of the pedestal, from whence it is intended to rise through a perpendicular pipe to the burner. A reservoir of water, or other fluid, is placed in the upper part of the pedestal, which descends by a pipe to the under part of the oil vessel, and there opening a valve upward, enters below the column of oil in the receptacle, and gradually raises it in the column up to the wick.

The principle on which this lamp is intended to act is by the difference of specific gravity between the oil and the water, or other

fluid employed in the descending column, which the patentee states, should be in the proportion of two to three. The form of the pedestal and shaft may be cylindrical, or of various other shapes, containing the reservoirs and pipes within.

When the charge of oil has been consumed, in order to recharge it, a high funnel is affixed to the top of the column, near the burner, into which the oil is to be poured, when by the superior height and consequent preponderating weight of the oil in the funnel above the burner, the water, or other fluid, will be forced back again into its elevated chamber, and will have no power to expel the oil from its receptacle until the high column in the funnel is removed.

The lamp is furnished with a receiving vessel for the occasional small overflow of oil, and also a vent aperture for the purpose of allowing the water to flow; and in its general appearance resembles other table lamps constructed upon the fountain principle. [*Ib.*

To CHARLES DEROSNE, *Gentleman, in consequence of a communication made to him by a certain foreigner residing abroad, and inventions by himself, for an invention of certain improvements in extracting Sugar or Sirop from Cane Juice and other substances containing sugar, and in refining sugar and sirops. Sealed 29th September,* 1830.

THIS invention consists in a mode of discolouring sirops of every description, by means of charcoal produced by the distillation of bituminous schistus alone; or mixed with animal charcoal, and even of animal charcoal alone.

Whatever sort of charcoal it may be, it must be disposed on very thick beds, on a filter of any suitable form. The filter of itself has nothing peculiar, and does not form the object of the patent, because it is already known and used for other purposes, but till now it has not been employed for discolouring sirops.

To obtain this discolouration, the charcoal is put in a case, in which is placed, at the distance of about an inch from the bottom, a metallic diaphragm pierced with a great number of holes; upon this diaphragm is placed a coarse linen, or woollen cloth, which exactly covers it; and upon this cloth a bed of charcoal of bituminous schistus alone, or mixed with animal charcoal, or animal charcoal alone, as above said. Whatever it may be, this charcoal ought to be in a finely divided state, in order that it may be well penetrated with the sirop which is intended to be filtered. Charcoal in powder would not be penetrated by the sirop.

It has been found that charcoal reduced to the size of fine gunpowder, is very fit for this operation; if the grain is too large, the filtration would operate too rapidly. The charcoal should be lightly pressed, and then new beds of the same charcoal placed upon it, which should likewise be pressed till it has come up to the height of fifteen or sixteen inches. It may be made higher if found necessary,

or it may be less, but the discolouring effect will be always in proportion to the thickness of the bed of charcoal.

When the charcoal is disposed to the proper thickness, it is to be covered with another metallic diaphragm, pierced likewise with holes, upon which is spread another clear linen cloth; upon this cloth the sirop is to be poured which is intended to be discoloured. The sirop ought then to form a bed of several inches thick, from four to eight, although there is no precise rule.

For operating well in the filtration of sirops, the sirop ought to be clear before pouring it upon the filter, and ought to have undergone a first filtration by the ordinary means; the object to be obtained by this filtration through the thick beds of charcoal is only the discolouration of the sirops.

The sirop to be filtered ought not to exceed the consistence, which is produced by two-thirds of sugar, and one-third of water; but it may be filtered at any less degree of consistency according to the result required. When the sirop is hot the filtration operates a great deal more rapidly.

In operating on a great scale, a reservoir filled with sirop can furnish several filters at one time. The first portion of sirop which passes through the filter is always the least coloured, and by the time the colouring part combines itself with the charcoal, the effect of the last portion becomes less sensible. That portion of sirops, which retains a part of its colour after filtration, can be passed again through another bed of charcoal in another filter, and by this means it may be obtained in a great degree of purification.

Whatever the kind of charcoal used, it is desirable to mix the charcoal with about one-sixth part of its weight of water before putting it in the filter. The place of that water is occupied by the sirop which penetrates the beds of charcoal; and when the water comes at first, it has a disagreeable and salted taste, when the animal charcoal is used, the water after that comes mixed with a portion of sirop, and soon after it is displaced by the pure sirop.

When the charcoal has been deprived of its discolouring effect, water is to be poured upon the filter for dissolving or displacing the sirop which may be mixed with the charcoal, the sirop then comes pure first, and after that mixed with more or less water, using as little water as possible. It is convenient to suspend occasionally the effusion of water on the upper part of the filter by shutting its cock. The sirop being heavier than the water, gains the bottom of the filter and runs first.

The sirops made with raw sugar by this process can be made as clear as water, the molasses are deprived of their bad taste, and are converted into a good kind of sirops of a clear and yellow colour.

The sirops from which it is desired to separate the colouring matter can be obtained directly from the juice of cane, or of beet root, or from the saccharine matter produced by the action of sulphuric acid upon the farinaceous matters, before these juices or liquids have been baked for extracting the sugar. The sirop may likewise be produced from the solution of all kinds of sugar, and of the products

of inferior quality, which are obtained in sugar refining under the name of "bastards" and other sugars. The purpose of producing of sirops may be to sell them in such a state for the ordinary consumption, or to bake them for making sugar whiter than is obtained by the common process, or these whitened sirops may be used for discolouring the refined sugar, in making them filter through the loaves, instead of the earth and water commonly used.

The object of the invention being to obtain discoloured sirops by the means above described, this discolouration of sirops is always proportionate to their primitive colouration, and to the quantity of charcoal which is used.

In the carbonization of bituminous schistus there is nothing peculiar; it is produced in close vessels, as is done for producing animal charcoal, only it is convenient before the carbonization, to separate from the bituminous schistus the sulphurets of iron which are mixed with it. Instead of using the schistus, or animal charcoal of the size of gunpowder, it can be reduced to a powder still more fine, mixed with sand. In this state a given quantity of charcoal discharges the colour better than powdered less fine, but the filtration is slower, and more difficult to be regulated. The patentee says, "having tried this method, I have given the preference to the other mode, but both of them are the object of the patent." [*Ib.*

To JOHN HENRY GUNTHER, *piano forte manufacturer, for his invention of certain improvements on piano fortes. Sealed* 10*th July*, 1828.

THIS invention is the adaptation of an additional sound board to piano fortes, which is to be made much stronger than the ordinary sound board, and to be placed above it. This board is proposed to be made of hard wood, about a quarter of an inch in thickness, but rather thinner towards the base; it is to be fastened to the framing of the instrument, and made particularly firm and capable of sustaining the tension of the strings, as the bridge and rails for the hitch pins are to be affixed to it. This and the ordinary sound board are to be connected by blocks, so that they shall both vibrate together; and it is stated that the adaptation of this improvement to piano fortes, whether of the horizontal or upright kind, very greatly improves the strength and tone of the instrument. [*Ib.*

To PETER RIGBY WASON, *Esq. barrister at law, for his having invented a certain improvement in the article commonly called stick sealing wax. Sealed* 25*th September*, 1828.

THE patentee has experienced what every one who seals a letter with wax must also have experienced, the great inconvenience of not being able to keep the stick of sealing wax in a blaze, or to make the wax flow on the paper, without the trouble of several times relight-

ing the stick; no one, however, that we have ever heard of before the patentee, has suggested the simple idea of placing a wick through the centre of the stick, which ingenious thought forms the subject of this patent.

The material, or composition, of which the sealing wax is made, though not claimed as new, is described as consisting of shell lac one part, vermilion one part, and Venice turpentine one part, (by weight we presume,) which are to be reduced into a mass over a slow fire, and when thus properly mixed, the portion which is to constitute a stick, is to be rolled out to its proper dimensions upon a heated copper plate: when that is done, a groove is to be formed along the middle of the stick, and a straw inserted, which is to constitute the wick. The stick of wax is then to be rolled again upon the heated copper plate, for the purpose of enclosing the wick, and being afterwards marked with such patterns or devices as may be thought desirable; on becoming cold the stick is ready for sale, or for use.

On lighting the end of this improved stick of sealing wax, the straw will sustain a small flame, which will, as a taper, keep the wax in a blaze, and flowing as long as may be required. [*Ib.*

To SAMUEL BROOKING, *Esq., a Rear Admiral in the Royal Navy, for his invention of a new method or mode of making sails of ships, and other vessels. Sealed 4th September*, 1828.

IT has been found that in consequence of the strain which is given to sails in angular directions, by the pressure of the wind, they invariably stretch from corner to corner, and bag in the middle, which causes them to be much sooner destroyed than they would otherwise be, if the strain was supported by a diagonal seam. It is therefore the intention of the patentee, instead of making sails by joining the breadths of canvass in perpendicular directions, to make the seams diagonally, that is, from corner to corner of the square sails, and in such manner crosswise of all other formed sails, as to give that strength and resistance in the direction of its greatest tension, which will prevent the stretching of the fibres of the material, and render the sails much more durable.

There does not appear by the specification, to be any novelty proposed in the mode of making the canvass, or in the forms of the sails, but merely in the way in which the canvass is to be cut, and the direction in which it is to be sown together, to make the sails, which constitutes the subject of this patent. [*Ib.*

Patent granted to JOSEPH BUDWORTH SHARP, *Esq., and* WILLIAM FAWCETT, *of Liverpool, Civil Engineer, for an improved mode of introducing Air into Fluids for the purpose of Evaporation. Dated October* 20, 1830.

IN the drawings of this specification a tube is represented suspended vertically over a circular pan, from the lower end of which tube two smaller ones radiate horizontally, and nearly touch the sides and bottom of the pan. The vertical tube, which is perforated at the upper part, works easily in brasses placed in a suitable framing, and by means of proper gear, is made to revolve in a horizontal direction. The result of this, it is assumed, will be, that by the movement of the radiating pipes in the liquid, an inclination to a vacuum is created; and the air, from this circumstance, rushing through the aperture at the top, passes through the liquid and causes a great evaporation, whilst the constant motion of the pipes prevents the liquid from collecting on the sides of the pan and carbonizing.

The nature and properties of the Sugar-Cane, with practical directions for the improvement of its culture, and the manufacture of its products.—By GEORGE RICHARDSON PORTER.*

[Continued from vol. vii. p. 342.]

WHEN all is properly prepared for each operation, and the reservoirs for the expressed juice are filled with a known and fixed quantity, it is made to flow into the first clarifier. The proportion of quick lime, for separating the feculencies, should be immediately ascertained. For this purpose, an hydraulic balance should be used; this was invented by an Englishman, and introduced, two or three years ago, into St. Domingo, (1789.) This balance, which is very ingenious, serves to show the quantity of feculencies which exist in the expressed juice, and the quantity of lime necessary to separate them. Although it may not rigorously indicate what is the necessary quantity for the complete clarifying, it is, however, very useful in determining the quantity of lime which ought to be employed in the first instance. Its use is extremely safe, as the proportion of lime which it indicates is never in excess. The lime thus weighed is put into the juice with which the first clarifier is filled. That its action may take place at the same time over all the juice, great care is taken to spread it, by agitation, for a minute or two, with a ladle; then it is poured entirely into the concentrator; after having filled all the boilers with a charge thus tempered, heat is applied. The coppers, of course, receive a degree of heat relatively to their proximity to the fire place. The juice of the concentrator, therefore, is the first whose feculencies separate; the action of the heat proceeds successively through the boilers. The first feculencies are removed by the scummer, from each of the boilers, as fast as they rise to the

* This valuable work has been recently republished by Messrs. Carey & Lea.

surface of the fluids; they are poured into wooden buckets, and carried to their place of destination. Those of the first clarifier are poured into the basin, which is between it and the wall, from whence they flow out into the vessel placed there to receive them. The impurities of the second sort are poured into the little basins, on the surface of the laboratory. The juice, which is unavoidably removed with them in scumming, carries them through the channels into the first clarifier, where they are again removed with the scummings of this copper. The scum is taken off as fast as it is produced, and to each charge, if it be thought necessary, lime in substance, or lime water, or some other alkali is added. When the sirop of the concentrator indicates twenty-two or twenty-four degrees of the saccharometer, the fire is damped, and the sirop is laded into the basin which communicates with the vessel. Immediately after having emptied the concentrator, it is filled again with the *entire* charge of the evaporator, the heat is continued, and the contents of each copper pass successively from one to the other till they reach the evaporator, leaving the first clarifier empty, and this is immediately supplied with a fresh accession of juice. In the mean time, as fast as the cane liquor reaches the vessel, placed at the foot of the reservoir, it is poured upon the filters, and falls into the reservoir, freed from the solid matter which it contained. The scumming and evaporation are continued—the contents of one copper are passed successively into another—the sirop in the concentrator is passed into the vessel, and thence into the reservoir for subsidence, till this is filled. The different steps of the work should be so disposed, that the first reservoir for subsidence should be filled about six or eight o'clock in the evening. Then the sirop, always evaporated to the same degree, is conveyed in the same manner to the second reservoir, by the canal which communicates with it, and this work is continued through the night. Towards five or six o'clock in the morning the fire is damped, and the concentrator is emptied; after well washing it, if required, the valve of the first reservoir is raised, the filtered cane liquor runs perfectly pure into the concentrator, having deposited, during eight or ten hours of perfect rest, the feculent and earthy particles which, owing to their extreme fineness, had passed through the filters.*

When the concentrator is charged by this means, with a quantity of sirop suitable for making a boiling, the valve is shut, and it is ascertained whether the clarifying is well and perfectly done. For this purpose some sirop is taken in a silver spoon, and inspected in

* Monsieur Bonmatin gave an account, in the year 1814, of his method of extracting sugar from beet root, which appeared to the French government to have so much importance, that they caused it to be printed and distributed in those departments where that branch of manufacture was followed. In this account Monsieur Bonmatin states, as one part of his process, that after the evaporation of the juice to the state of sirop, as indicated by 32° of Beaume's saccharometer, and before its concentration, to obtain crystalline sugar, he allows the sirop to rest during four days, in order that all the foreign matters which it contains may subside.

different points of view, in order to ascertain that it contains nothing perceptible to the eye. Some drops of lime water are poured into this sirop, which should appear very clear and transparent, and it is then examined anew.

If after one or two minutes no solid particles are perceived to swim in the liquor, we may be assured that the clarifying is complete. Heat is then applied to finish the evaporation and concentration. If the sirop is suspected to be of bad or middling quality, then a test of caustic alkali, well filtered and mixed with lime water must be employed. If the action of these agents causes the appearance of any flakes of feculent matter, then a temper of lime or other alkali is put into the sirop, in proportions regulated by the quantity of the flakes, which, in this case, are always very trifling. They are soon separated by the concurrent action of the temper and heat, which raises them to the surface, whence they are easily removed by the scummer. When the colour of the sirop is a very deep brown, and lime water and alkalis fail to separate any feculencies, it may be presumed that its darkness is, in part, owing to an excess of temper, which holds the mucilage, and sometimes also a portion of the second feculencies, in solution. In this case very diluted sulphuric or oxalic acid may be used as a test, for if the alkali is in excess, either of these acids will precipitate it in the form of a neutral salt, and the acid will also affect the colouring part of the mucilage: the base of this juice is then precipitated in the form of white flakes, and any portion of the second kind of feculencies, which the alkali may have held in solution, is likewise precipitated. To remedy this excess of alkali, very diluted sulphuric acid, or cream of tartar, citric acid, or oxalic acid, may be used. But to employ these different acids with success, a person must be well acquainted with their properties. They may, however, be dispensed with in the method we are now explaining, by being careful to procure good lime, and weighing it with accuracy. While the charge of the first concentrator, and all the contents successively, of the first reservoir, are being concentrated, scumming and evaporating are continued in the three preceding coppers, and the sirop of the evaporator, after being carried to the proper point of concentration, is passed from this copper to the second reservoir, always through the little basin and the canal which communicates with it; this reservoir continues to be thus filled, (always previously passing the sirop through the filters,) till all the contents of the first reservoir are concentrated; this ought to happen at about six or eight o'clock in the evening; at this moment the charge of the evaporator is passed into the concentrator, which is again converted into an evaporator.

If it is requisite, the first reservoir for subsidence is washed, and then it is filled anew, as at first, with the sirop, evaporated in the concentrator to the proper fixed point. The second reservoir is left to subside during the night, and at five o'clock in the morning the boiling of the sirop from this reservoir is begun, similarly to that from the first reservoir on the preceding day. This order once established, it continues always in the same alternation. Thus, in this

work, each charge of expressed juice passes from one copper to another without being mixed, and receives, successively, the degrees of heat most proper for its different stages of clarification and evaporation. The temper of each charge can be regulated according to the signs presented by the scum, and to the bubbles formed in ebullition, &c., but to these signs implicit confidence must not always be attached. All the solid matters which have escaped the scummer, are most successfully removed by the filtration and subsidence to which the sirop is subjected, without any increase of labour, since the progress of this method does not require a greater number of negroes than is ordinarily employed in the usual method. The clarifying and evaporating begin almost at the same time, and advance together to the reservoirs for subsidence, where the clarifying is entirely finished. The action of heat upon the feculencies ought to be moderate, a too slow or too rapid heat are both injurious. In these coppers it can be graduated at will, the shape and material being favourable for this desired effect. When once the power of the furnace is known, the charge of the clarifier can be regulated accordingly, by augmenting or diminishing the quantity of the expressed juice in such a manner that it may arrive at the desired point of clarification in the required time.

The sirop is never evaporated to such a density as in any way to injure or obstruct the separation and removal of the feculencies by the scummer. The charge of the first clarifier being from 250 to 370 gallons of juice, and this charge passing entire from one copper to another, the proportion of water which the cane liquor contains, is always great enough to allow free scope to the feculencies to separate and be disengaged by the scummer; for, however rapid the evaporation may be, its progress can be regulated at will to the fixed point for filtration and subsidence.* This point is ascertained by the saccharometer, an instrument formed of a bulb of copper, two or three inches in diameter, attached to a tube six or eight inches in length. This saccharometer is charged with grains of lead, adjusted in such a manner, that, at the 24th degree of Beaume's scale, the bulb, plunged in the fluid, would be just covered to the commencement of the tube. The negro boiler being made acquainted with this point, is charged to watch the work; it may with safety be abandoned during the night to his guidance, as the concentrating only takes place during the day; the negroes have nothing more to do than to weigh the lime for each charge of the expressed juice, which is put into the clarifier, then to scum and pour the cane liquor on the filters. The progress, in the usual method, with iron boilers, has none of these advantages; on the contrary, they have the opposite defects.

After the account we have given of the progress of clarifying, evaporating, and concentrating, in the laboratory, with the four copper

* The rapidity of the evaporation can constantly be ascertained by reference to the table, page 206; that, connected with the use of the saccharometer, should regulate the progress.

boilers, it is easily perceived, that when these three operations in the laboratory are pursued as it is proposed, the different steps of the work will, although divided, be absolutely the same. The concentration performed in a single vessel, over one fire, or in the laboratory with a double furnace, will not, in any way, be different in its execution to that in a laboratory with four coppers; it will only require the attendance of a few more negroes; but in a large plantation it is essential that the work should be performed very rapidly, and therefore its steps should be more divided.

The cane liquor being now entirely deprived of all solid matters by the means just described, it can be concentrated to the required point, its state being fully ascertained before concentration, and the defect, (if any,) in alkali being easily remedied.

The advantage of concentrating only during the day is very important, as the overseer can thus bestow his attention and care upon the concentration of the whole, without being obliged to watch all night; the operations during this period being reduced to those of clarifying and evaporating, may safely be entrusted to the negro commander or head boiler, who is one of the most trust worthy persons on the plantation.

The proportion of essential salt which the cane liquor contains, cannot by any means be augmented—the sweet and saccharine mucous juices cannot be converted into sugar—nor can the former and the mucilage be removed before the complete concentration of the sirop, since those juices are more soluble than the essential salt. The end proposed then, is to extract the greatest possible quantity of this salt in the best possible state; for this purpose we must borrow the aid of chemistry, the principles of which are much more required in the concentration and crystallization of middling and bad sirop, than in that of good quality. The sweet and saccharine mucous juices, cannot support nearly as high degrees of heat as the essential salt; they are immediately decomposed by the application of degrees of heat, which may safely be used to sirop of good quality. The business of concentration, as we have before observed, is the action of heat upon the water of solution of the sugar. The sugar-boilers, both of America and Europe, have rarely had a just conception of the action of heat in the operation of concentration; their knowledge has generally been confined to some terms, which serve to designate the particular state in which the sirop under concentration is found; the recollection of these terms too often makes up the whole science of the sugar-boiler.

Concentration being the action of heat upon the water of solution, ought necessarily to begin and terminate at fixed degrees of the thermometer. The truth of this position Dutrone affirms to have been demonstrated to him by multiplied experiments, made with solutions of sugar, refined to a state of perfect purity, and to which he applied the action of heat at each degree, commencing at 83°, and ending at 110° of Reaumur. This scale is not in use in England or her colonies, and, therefore, in the following table we have added another column, with the corresponding degrees in the scale of Fahrenheit.

Each of the experiments was made with a solution of one hundred pounds of sugar in sixty pounds of water. When the degree of heat indicated by the thermometer is ascertained, a reference to this table will show, at one glance, what proportion of the water of solution has been evaporated—what quantity of sugar is thereby rendered capable of passing to the solid state—and how much water is yet to be evaporated before the remainder of the sugar can be crystallized. If, for example, during the process of concentration, the thermometer rises to 230° Faht. or 38° Reaumur, this table informs us, that 31 lbs. 3 oz. 4 dr. of water have been evaporated, that 52 lbs. of sugar have thereby been rendered capable of crystallizing, and that 28 lbs. 12 oz. 12 dr. of water remain to be evaporated, before the remainder of the sugar, 48 lbs., can assume the solid form.

Table of the action of heat upon a saturated solution of sugar commencing at the point of saturation, and terminating at the point of perfect crystallization.

Degrees of thermometer.		Water of solution evaporated at each degree.			Products of crystallized sugar at each degree.			Water which remains combined to the sugar in the state of sirop, after the crystallization at each degree.			Sugar which remains combined with the water in the state of sirop at each degree.		
Fahrenheit.	Reaumur.	lbs.	oz.	dr.	lbs.	oz.	dr.	lbs.	oz.	dr.	lbs.	oz.	dr.
219	83	0			0			60			100		
221	84	4	12	14	8			55	3	2	92		
223	85	11	8	14	19	4		48	7	2	80	12	
225.5	86	18			30			42			70		
228	87	24	9	10	41			35	6	6	59		
230	88	31	3	4	52			28	12	12	48		
232	89	33	11	10	56			26	4	6	44		
234.5	90	36	3		60	5		23	13		39	11	
237	91	38	1		63	4		21	15		36	12	
239	92	39	4		66	3		20	12		33	13	
241	93	41	7	10	69	2		18	8	6	30	14	
243.5	94	43	4		72	1		16	12		27	15	
246	95	45			75			15			25		
248	96	46	7	4	77	7		13	8	12	22	9	
250	97	48	7	8	80	5		11	8	8	19	11	
252.5	98	50	1	10	83	3		9	14	6	16	13	
255	99	51			85			9			15		
257	100	52	5	14	87	4		7	10	2	12	12	
259	101	53	1	6	88	6		6	14	10	11	10	
261.5	102	54	1		90	1		5	15		9	15	
264	103	55	3	10	91	4		4	12	6	8	12	
266	104	55	12		92	7		4	4		7	9	
268	105	56	7	10	94	2		3	8	6	5	14	
270.5	106	57	3	8	95	5		2	12	8	4	11	
273	107	58	6	8	97			1	9	8	3		
275	108	58	14	8	98	2		1	1	8	1	14	
277	109	59	7	10	99	2			8	6		14	
279.5	110	60			100								

Although soluble matters, other than the essential salt, are combined with the water of solution, the water is, nevertheless, always united with it in a relative and determinate proportion: the thermometer ought, therefore, to be employed to determine its concentration, the solid product having always relation to the proportion of water which the heat has evaporated at each degree of this instrument. If the extraneous matters exist in a greater abundance, the quantity of pure sugar will be less than that marked in the foregoing table.

The use of the thermometer in concentration, far from excluding the proof of the finger, which is very convenient, serves, on the contrary, to render its practice less equivocal, giving to the operator fixed rules, by which he may be more safely guided.

Sirop, when concentrated beyond the point of solution, assumes, in cooling, the crystalline form: experience shows us that the molecules of similar bodies, in taking this form, require to move freely in the fluid which holds them in solution, in order to their exercising upon each other their mutual attraction. These molecules take, in their union, a form much more regular in proportion as the water, in which they unite themselves, is more considerable. When the mother water exists in a great proportion, compared to the sugar which is to be crystallized, very large and regular crystals are formed; in this state it is called sugar-candy.* We know that salts are much more pure and perfect, as the forms they make approach nearer to those which nature has assigned to them. Sugar-candy is in the most perfect state that can be desired, and the means that it is proper to employ, to extract the essential salt of the cane, ought, therefore, to be founded on this principle of chemistry—*to crystallize in a considerable quantity of water*—a principle fully ascertained and established for all bodies which crystallize in cooling.

[*Repertory of Patent Inventions.*

Remarks on Lotteries.

TO THE EDITOR OF THE JOURNAL OF THE FRANKLIN INSTITUTE.

Sir,—Although your journal may not, to some persons, appear to be the proper place to examine the subject of lotteries, yet as it is one which interests the labouring classes in an especial manner, this consideration may probably induce you to allow a page to an operative mechanic to present his cogitations to your readers. I am emboldened to do this from your having published in your July number, the specification of Mr. Jas. K. Casey's patent for what he denominates a *Self-operating Lottery*. It appears to me that the plan proposed by that gentleman, would, if carried into general effect, remove most of the evils which result from the nefarious and beggar

* Crystallizing in a great quantity of water should not be confounded with crystallizing in a great mass, as a planter of St. Domingo did, who had a crystallizing vessel made twenty feet long, ten feet wide, and two deep; the crystallization of sugar, with a proportionate large quantity of water, can be performed in the smallest vessels.

making schemes with which our country is inundated, to the utter ruin of thousands among the poor and thoughtless, who are induced to resort to this most pernicious mode of gambling; a mode by which they are swindled out of their hard earnings, to support and enrich some thousands of lottery ticket venders; a class of men who, to say the least, are among the most unproductive class of society. I have taken some pains to investigate the operation of the existing lotteries, and may hereafter, if not anticipated by some abler hand, offer you some calculations which I think will astound every one who has not put himself to the same trouble. No legislature, fully informed of the evil consequences of lotteries as at present constituted, would ever have tolerated so great an evil. In this city, (New York,) I have been gratified to see that a most respectable grand jury has, in effect, presented the present mode of managing and drawing lotteries as a nuisance of a most offensive and pernicious character; and this they have boldly and properly done, although the evil itself is legalized, and cannot, therefore, be immediately suppressed, but must for awhile continue to inflict its mischiefs *in due course of law.* I have somewhere seen it observed that "the worst poison is that which poisons the physic." Are the nostrums of the vilest charlatans, one half so deleterious as the quackery of our lottery puffers?

I know that among the contractors for lotteries there are some very respectable men; and do not they, who are so fully aware of the evil, owe it to the community to abate the nuisance, especially if there is any plan by which it can be effected whilst they may make a sufficiently profitable investment of their capital, by embarking it in a scheme which, whilst it would satisfy those who are disposed to make speculative adventures, would protect that class who are now made the wretched dupes of hope forever deferred.

I have no time to analyze *Mr. Casey's self-operating lottery;* it appears to me, however, obviously free from the most crying, if not from all, the evils incident to the existing plan of conducting and *drawing* lotteries. I wish that you, sir, or some other person qualified for the task, would undertake to enlighten the public mind more fully upon this subject, in doing which I am convinced it will be made fully manifest that a more extensive imposition was never practiced or endured. I hardly think it possible to influence the legislatures of all the states in our extensive country to prohibit lotteries altogether. In many places the public will probably continue to call for them, and in this case the question of the greatest importance is, how can this wish be gratified with the least possible inconvenience and loss.

Yours,

A Mechanic.

New York, August 20th, 1831.

Madder, Woad and Barilla.

We observe with pleasure that the Pennsylvania Horticultural society have instituted an inquiry in relation to these important sta-

ples; madder is especially interesting to the manufacturers of the United States, and as it is a very desirable object to ascertain how far its cultivation may be safely recommended to the agriculturists of this country, we have pleasure in republishing the circular of the Horticultural society, with a view to call the attention of our distant subscribers to it.

To our city readers we may state that the question has been proposed for discussion at the meeting of the Institute on the 22nd of September.

P. C.

[CIRCULAR.]

Philadelphia, November, 1830.

At a meeting of the Pennsylvania Horticultural Society, held on the 8th instant, the undersigned were appointed a committee to "inquire into and report what progress has been made in this country in the cultivation of dyers' madder, and whether it will be proper for the Horticultural Society to adopt any measures to extend its cultivation." They were also instructed to include in their inquiries, "the culture of Barilla, and its preparation for the purposes of commerce."

Impressed with the importance of the objects committed to their attention, they are desirous of collecting as much information as possible, before they adopt any conclusion upon the questions referred to them. This, they are aware, must depend, in a great measure, upon the liberal communication of facts and observations, on the part of those who are practically conversant with these articles, either as agriculturists, merchants, or manufacturers.

With this view, they respectfully request that you may be pleased to communicate to them such information as you may possess, in relation to the cultivation of either of these plants—to the extent to which they are raised in, or imported into, this country—to the preparation which they undergo to fit them for commerce—to the fluctuations which have been observed in their abundance, and price in our markets—to their adaptation to the soil and climate of this country—to the diversities observed in the qualities of merchantable madder, and barilla, and to the causes which are supposed to produce these diversities—in a word, to every point which can throw light upon this subject.

Being desirous of giving to their investigations the widest range, the committee prefer submitting it to your attention, under this general aspect, than under the more restricted one of formal questions. They hope that the extent to which these plants minister to several useful arts, will be a sufficient inducement to secure the attention of all such as take an interest in the success of our agriculture and manufactures.

Respectfully,

WILLIAM H. KEATING,
SAMUEL BRECK,
MOSES BROWN.
} *Committee.*

N. B. Please direct your communications on this subject to any one of the members of the committee, or to David Landreth, Jr., Corresponding Secretary of the Pennsylvania Horticultural Society.

Although the resolutions of the Society are restricted to the above mentioned plants, yet we shall be obliged to you if you annex any information you may possess on the subject of *Woad.*

Account of some experiments made at Mr. Laird's works, at North Bickenhead, with the New Low Pressure Boiler, on the exhausting principle of Messrs. Braithwaite and Ericsson, by ALEXANDER NIMMO, *C. E., Dublin, and* CHARLES B. VIGNOLES, *C. E., London.*

THE exhausting apparatus consisted of a fan wheel, with broad radial leaves, revolving within a close box or chamber, placed a little apart from the boiler, but connected with it by a passage leading from the flues traversing the boiler; a short tube above the exhausting chamber passed out to the atmosphere.

The furnace was attached to, and placed at the end of, the boiler, opposite to the exhausting apparatus, which latter being put to work, drew through all the turns of the boiler the hot air from the fire, which passed over the throat of the furnace through the bridge flue, and then successively through the other five turns of the flue arranged through the boiler, and, finally, was drawn through the exhausting chamber, and passed into the atmosphere.

The heat, which in the furnace was extremely intense, was absorbed by the water in the boiler, as the air rushed through the flues, and when passing up the tube or funnel from the exhausting chamber, was so far cooled that the hand and arm might be placed with impunity down the tube, the temperature not exceeding 180° Fahrenheit.

Not the slightest smoke was perceptible.

The following are the principal dimensions measured:—

	Ft.	In.			Ft.	In.	
Furnace.	2	0 deep.	Ash Pit.		1	0 deep.	The openings of the fire-bars equal to about half the area of the bottom.
	2	6 long.			2	6 long.	
	2	6 wide.			2	6 wide.	

	Ft.	In.				
Exhausting Chamber.	2	6 high.	Outside dimensions.	Diam. of exhausting wheel, - - -	3	0
	3	6 wide.		Breadth of the same,	0	10
	3	6 long.				

Bridge flue or throat, from the furnace, 2 ft. 6 in. broad, 4 in. wide, 2 ft. deep - - - - - - 5—16 in. iron plates.

First turn of the flue, 4 in. wide, 2 ft. deep, 2nd, 3d, 4th, and 5th turns, 3 in. wide, 2 ft. deep, - - - - - - - - ¼ in. iron plates.

Whole length of the flues through the boiler, 45 feet.

Superficial area of the heating surface, - 247 square feet.

The contents of the water in the boiler, when filled, were from - - - - - 85 to 90 cubic feet.
The superficial area of the evaporating surface, nearly - - - - - - - - - 33 square feet.
The proportion of the heating to the evaporating surface, nearly - - - - - $7\frac{1}{2}$ to 1.

Steam Chamber. { 3 ft. wide. 4 ft. 10 in. average depth. 4 ft. 6 in. long. } Containing about 65 cubic feet.

Diameter of the safety valve, very nearly 5 inches; being 19 square inches area, which was loaded for a pressure of 4 lbs. on the square inch, giving 76 for the load. Of this, 66 lbs. of iron was placed in the boiler, and 10 lbs. allowed as the weight of the valve, rod, hook, handle, &c.

The water used was the salt water from Wallasey Pool, and filled into a large iron tank, the area of the surface of which measured $32\frac{1}{2}$ superficial feet.

The boiler was placed upon an open shed; the day was very cold, with thick rain. No engine being attached to the boiler, the exhausting apparatus was worked by a wheel and band from Mr. Laird's turning engine. The velocity of the circle of percussion of the leaves of the exhausting wheel, was determined to be about 77 feet per second, or upwards of 52 miles an hour. Mr. Laird's engine is stated to be a 4 horse power. No determinate measurement was made, but the engineers present computed, that the power applied to turn the exhausting wheel, was equal to that of two horses.

The fire being lighted, the steam was got up to 4 lbs. pressure in 45 minutes, with a consumption of $2\frac{1}{4}$ cwt. of coke. The expenditure at first was 8 lbs. per minute, and gradually decreased to 5 lbs.; averaging about $6\frac{1}{4}$ lbs. per minute for getting up the steam. The steam began to rise in 27 minutes, after which the consumption of coke was little more than 5 lbs. per minute; and at this period there would have been a sufficient supply of steam to work the cylinders of an engine.

The coke employed was gas coke, of very bad quality, of which $3\frac{1}{2}$ cubic feet weighed 105 lbs. giving 30 lbs. for the weight of a cubic foot, or 3000 lbs. as the weight of 100 cubic feet. The same weight of St. Helen's coal, (that principally used in steamboats,) measured 63 cubic feet. The cost of the coke used was 8*s.* 6*d.* per ton, delivered in Liverpool; the cost of Smithy coke being 25*s.* per ton, of which $3\frac{1}{2}$ cubic feet weighs 115 lbs., giving very nearly 33 lbs. for the weight of a cubic foot.

When the steam was up, the water in the thick glass gauge attached to the boiler, standing at $7\frac{1}{2}$ inches, the two men stationed for the purpose began to pump, a fresh supply of weighed fuel was placed on the floor, and the following observations were made:—

Hours.	Min.	
At 3	32	began to pump.
At 3	54	—16 cubic feet of water were evaporated.
At 4	12	—27 cubic feet of water were evaporated.

Hours. Min.

At 4 19—38 cubic feet of water were evaporated; and 2 cwt. of coke consumed.

At 4 32—41½ cubic feet of water were evaporated, with a consumption of 252 lbs. of coke.

From which it appears, that only 6 lbs. of coke per cubic foot of water per hour was consumed, and the evaporation of a cubic foot of water per hour being generally considered the measure of a horse power, the conclusion is, that the boiler was a 40 horse boiler, and that the quantity of fuel requisite to work it is 2½ cwt. per hour, the expense of which is 12¾*d.* and as the consumption diminishes after the first hour, the expense of fuel will probably not exceed 1*s.* per hour for the forty horse boiler.

(Signed,)

ALEXANDER NIMMO, C. E.
CHARLES B. VIGNOLES, C. E.

Oil for Chronometers.—By Mr. HENRY WILKINSON, *of Pall Mall.*

From the Transactions of the Society of Arts.

THE best olive oil in its recent state possesses that peculiar bland flavour which fits it for the table, and which appears to arise principally from the quantity of mucilage and water, either held in solution, or mechanically mixed with it. By keeping one or two years in jars, a considerable portion of the mucilage and water subsides, which renders such oil not only cheaper, but better qualified for yielding a greater proportion of *pure* oil than that which is recently expressed from the fruit. Two or three gallons skimmed from the surface of a large jar that has remained at rest for twelve months or upwards, is preferable to any succeeding portion from the same jar, and may be considered the cream of the oil. Having procured good oil in the first instance, put about one gallon into a cast iron vessel capable of holding two gallons; place it over a slow clear fire, keeping a thermometer suspended in it; and when the temperature rises to 220°, check the heat, never allowing it to exceed 230°, nor descend below 212°, for one hour, by which time the whole of the water and acetic acid will be evaporated: the oil is then exposed to a temperature of 30° to 36° for two or three days, (consequently winter is preferable for the preparation, as avoiding the trouble and expense of producing artificial cold; by this operation a considerable portion is congealed; and, while in this state, pour the whole on a muslin filter, to allow the fluid portion to run through; the solid, when redissolved, may be used for common purposes. Lastly, the fluid portion must be filtered once or more through newly prepared animal charcoal, grossly powdered, or rather broken, and placed on bibulous paper in a wire frame, within a funnel; by which operation rancidity, (if any be present,) is entirely removed, and the oil is rendered perfectly bright and colourless.

HENRY WILKINSON.

Bibliographical Notices.

It has long been our design to give not merely a list of new publications relating to the useful arts, general science, internal improvements, and popular education, but occasionally to accompany the notice of them with such remarks as shall indicate our own opinion of their merits. In a work like the Journal of the Franklin Institute, reviews of this kind must necessarily be brief; we, however, shall treat such publications as may come under our notice with the same freedom and candour as have characterized our analysis of new patents. We shall be obliged by any aid given to us in our undertaking by the readers of this Journal; for, although situated in the political metropolis of the United States, we are without the means of a resort to Athenæums, Libraries, and Reading Rooms, such as exist in Philadelphia, New York, and Boston, where the new publications which would properly come within our province may always be found.

We are frequently asked what books we would recommend as best calculated for the instruction of those who wish to obtain information respecting the useful arts generally; and for the satisfaction of such persons we may occasionally advert to works of merit, which although they may have been for some time before the public, are not so extensively known as they deserve to be.

We know of some editors who have a happy talent at commending almost every work placed upon their desks by the kindness of authors or publishers; we shall be very glad to receive works in this way, but when we read, and more especially when we write about them, we shall be very apt to forget that they have been presented to us, and to sin against the old proverb which forbids our "looking a gift horse in the mouth." We hope, however, never to forget that courtesy which is always due to kind intentions; and will ever bear in mind that wantonly to wound the feelings of others is not the less a crime because it is one which is frequently committed.

The Introductory Discourse and Lectures delivered in Boston, before the Convention of Teachers, and other friends of Education, assembled to form the American Institute of Instruction. Boston, Hillard, Gray, Little & Wilkins, 8mo. pp. 352.

It is delightful to witness the public excitement which exists upon the subject of general education, and to see the wisest heads, and ablest hands, employed in directing the use of this most important of the instruments of public virtue, liberty, and happiness. The work before us consists of an Introductory Discourse by the Rev. President Waylard, of Browne University, and of thirteen Lectures upon various subjects intimately connected with education, delivered before a convention assembled in Boston, in August, 1830, for the purpose of forming an *American Institute of Education*. The lectures

are—On Physical Education, by John C. Warren, M. D.—On the Development of the Intellectual Faculties, and on Teaching Geography, by James G. Carter—On the Infant School System, by William Russell—On the Spelling of Words, and a rational method of teaching their meaning, by Gideon F. Thayer—On Lyceums and Societies for the Diffusion of Useful Knowledge, by Nehemiah Cleavland—A Practical Method of Teaching Rhetoric, by Samuel P. Newman—On Geometry and Algebra, by F. J. Grund—On the Monitorial System, by Henry K. Oliver—On Vocal Music, by William C. Woodbridge—On Linear Drawing, by Walter R. Johnson—On Arithmetic, by Warren Colburn—On Classical Learning, by Cornelius C. Felton—On the Construction and Furnishing of School Rooms, and on School Apparatus, by William J. Adams.

These lectures were prepared during those hours which are ordinarily given to relaxation, by gentlemen engaged in the arduous business of teaching. There is, of course, much variety of style, as well as diversity of subject, but they are all highly practical in their tendency; and the teacher who can rise from the perusal of them without having increased his stock of information, must have commenced the task with his measure of capacity already filled, or altogether incapable of retention.

It is not to teachers alone that the work addresses itself. The admirable lecture of Dr. Warren on Physical Education, and indeed several of the others, afford useful lessons to every one engaged in forming the moral and physical habits of the rising generation.

The Working Man's Companion, Part 1.—*The Results of Machinery, namely, Cheap Production, and Increased Employment, exhibited, being an Address to the Working Men of the United Kingdom.*—Philadelphia, republished by Carey and Hart, 18mo. pp. 216, 37½ cents.

We have recently published large extracts from this very excellent production, and our readers, therefore, have had an opportunity to form a judgment of its merits. The subject upon which it treats had occupied much of our attention, but we have derived more information from the perusal of this little work, than from all our previous inquiries, and we recommend the reading of it to every one interested in the progress of the mechanic arts—and who is not?

The Working Man's Companion will consist of a series of works; which will be published in a neat manner, and at a very low price.

The American Library of Useful Knowledge. Published by authority of the Boston Society for the Diffusion of Useful Knowledge, Vol. 1. Boston, 12mo. pp. 320, 75 cents.

This, like the preceding work, is to be continued by the occasional publication of other volumes, intended to form a well assorted

popular library; consisting, in part, of original productions, and in part of a reprint of the most meritorious of those which appear in England.

The present volume comprises a Discourse delivered by Judge Story before the Boston Mechanics' Institution—A Lecture delivered before the same Institution, by the Hon. Daniel Webster—An Essay on the importance to Practical Men, of Scientific Knowledge, and on the Encouragements to its pursuits, by the Hon. Edward Everett—A Lecture to the Working Men's Party, by the same—Dissertation on the Objects, Advantages, and Pleasures of Science, by Lord Chancellor Brougham—An account of Lord Bacon's Novum Oraganon Scientarium, or New Method of Studying the Sciences—A Discourse on the Nature and Advantages of the Study of the Physical Sciences, Part 1, by J. F. W. Herschell, Esq.

This is a neat, compact, and highly valuable volume. The names and talents of the writers of the respective pieces are so well known, that any commendation from us would not be merely superfluous, but might justly be considered as a mark of vanity. If its diffusion be commensurate with its merits, there are few volumes which will be more generally read.

New Conversations on Chemistry, adapted to the present state of that Science; wherein its elements are clearly and familiarly explained; with one hundred and eighteen engravings, illustrative of the subject: Appropriate Questions; a List of Experiments, and a Glossary. On the foundation of Mr. Marcet's "Conversations on Chemistry." By Thos. P. Jones, M. D. Philadelphia, John Grigg, 12mo. pp. 332, $1 25.

The Editor undertook this work with the design of introducing such improvements in the well known "Conversations on Chemistry," as were rendered necessary by the numerous and great discoveries made in that science, but in the prosecution of this intention he soon found that it would be more easy to produce a book which should be essentially new, than to remodel the original. His great aim has been to furnish a work which should be both comprehensive and familiar. A Conversation on the Steam Engine has been introduced, which, it is hoped, will enable any one who peruses it with attention, to understand the leading principles upon which the action of that instrument depends.

Meteorological Observations for August, 1831.

	Moon. Days.	Therm. Sun rise.	Therm. 2 P. M.	Barometer. Sun rise.	Barometer. 2 P. M.	Dew point	Wind. Direction.	Wind. Force.	Water fallen in rain.	State of the weather, and Remarks.
	☾			Inches	Inches				Inches.	
1		72°	86°	29.94	30.00	73	W. W.	Moderate.		Cloudy—flying clouds.
2		72	84	29.90	29.90	73	SW.	do.		Cloudy—rain in night.
3		72	80	29.90	29.90	68	NW.	do.	.12	Clear day.
4		72	84	29.90	29.90	68	NW.	do.		Clear—cloudy.
5		72	84	29.90	29.90	68	NW.	do.		Cloudy day.
6		72	84	29.90	29.90	68	NW.	do.		Cloudy day.
7		72	84	29.90	29.90	68	NE.	do.		Cloudy day.
8		72	84	29.90	29.90	68	NE.	Gale.	.9	Cloudy—rain.
9		72	84	29.90	29.90	68	NE.	Calm.	1.12	Cloudy—rain.
10		72	84	29.90	29.90	68	W.	Light.	1.11	Rain.
11		72	84	29.90	29.90	68	N. SW.	Calm.		Cloudy—clear.
12		72	84	29.90	29.90	68	SW. NW.	Moderate.		Cloudy day.
13		72	84	29.90	29.90	68	NW.	do.		Clear—overcast.
14		72	84	29.90	29.90	68	NW.	do.		Clear day.
15		72	84	29.90	29.90	68	W.	do.		Clear day.
16		72	84	29.90	29.90	68	SW.	do.		Clear day.
17		72	84	29.90	29.90	68	W.	do.		Clear day.
18		72	84	29.90	29.90	68	SW.	do.		Clear day.
19		72	84	29.90	29.90	68	SW.	Calm.		Clear day.
20		72	84	29.90	29.90	68	SW.	Breeze.		Clear day.
21		72	84	29.90	29.90	68	SW.	do.		Clear day.
22		72	84	29.90	29.90	68	SW.	do.	.93	Cloudy—clear.
23		72	84	29.90	29.90	68	SW.	Moderate.		Cloudy—clear.
24		72	84	29.90	29.90	68	SW.	Calm.		Cloudy day.
25		72	84	29.90	29.90	68	SW.	do.	.73	Drizzling—cloudy.
26		72	84	29.90	29.90	68	SW.	Moderate.	.72	Cloudy day.
27		72	84	29.90	29.90	68	SW.	Breeze.	.40	Drizzling—showery.
28		72	84	29.90	29.90	68	S.	Calm.		Clear day.
29		72	84	29.90	29.90	68	NW.	Moderate.		Clear day.
30		72	84	29.90	29.90	68	NW.	do.		Clear day.
31		72	84	29.90	29.90	68	NE.	do.		Clear—overcast.
Mean	00.16	72.90		29.91		65.1			4.67	

		Thermometer.	Barometer.
Maximum height during the month,		87. on 16th, 18th & 24th.	30.14 on 29th.
Minimum	do.	57. on 20th.	29.42 on 2nd.
Mean	do.	74.53	29.90

ERRATA.

The following references to the wood cut of Smith's revolving plane should have been inserted at page 162.

A, Belt wheel used by hand power on small machines—the belt passing over the pulley which is placed upon the axis of the plane wheel.

B, The plane wheel, into which the irons are fixed in such shape and number as the work requires.

C, The piece of timber to be planed or wrought upon, which is placed upon the carriage and secured by dogs or holdfasts.

D, The carriage moved by a rack of iron attached to the bottom part.

E, The cog wheel that moves the carriage.

F, The dogs or holdfasts.

G, The pulleys, of different sizes, placed upon an axis that moves the pinion wheel forward—and backward, by a cross band.